RMP COACH

PROJECT RISK MANAGEMENT

Course

PMI-RMP

Engr. ALAA SULTAN

Senior Project Manager

PgMP, PMP, PMI-RMP, OCP, 6SIGMA

PROJECT RISK MANAGEMENT PMI-RMP
INSTRUCTOR

ALAA SULTAN

Senior Project Manager,
PgMP,PMP, PMI-RMP, Oracle-OCP, 6Sigma.

- 23 years of Project Management Project experience managing medium to enterprise sized projects, involving all project phases in the Middle East area/Egypt and Gulf Region.

- Strong Project Management and Business Analysis experience in multiple projects and strong customer focus with emphasis on delivering quality solutions.

COURSE OBJECTIVES

After completion the course, you will be able to.

- ❑ Plan risk management.
- ❑ Identify risks.
- ❑ Qualify risks.
- ❑ Quantify risks.
- ❑ Plan risk responses.
- ❑ Monitor and control risks.
- ❑ Pass the PMI-RMP exam.

WHO SHOULD APPLY?

- If you have advanced knowledge and experience in risk management.
- If you are a project manager focused on project risk management, including for large projects and/or complex environments.

PMI-RMP LINK
https://www.pmi.org/certifications/types/risk-management-rmp

PROJECT RISK MANAGEMENT PMI-RMP

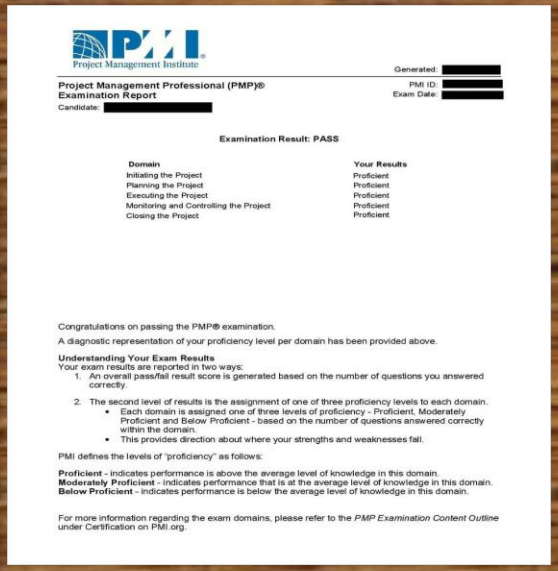
RMP OVERVIEW

Gain and Maintain Your PMI-RMP

- The certification exam has 170 multiple-choice questions and you have 3.5 hours to complete it.

Total Questions	Time/hours	Scored questions	Future test questions
170	3.5	150	20

- To maintain(Renew) your PMI-RMP, you must earn 30 professional development units (PDUs) in risk management topics every three years.



Project Management Institute

Generated: [redacted]

Project Management Professional (PMP)®
Examination Report

PMI ID: [redacted]
Exam Date: [redacted]

Candidate: [redacted]

Examination Result: PASS

Domain	Your Results
Initiating the Project	Proficient
Planning the Project	Proficient
Executing the Project	Proficient
Monitoring and Controlling the Project	Proficient
Closing the Project	Proficient

Congratulations on passing the PMP® examination.

A diagnostic representation of your proficiency level per domain has been provided above.

Understanding Your Exam Results
Your exam results are reported in two ways:

1. An overall pass/fail result score is generated based on the number of questions you answered correctly.
2. The second level of results is the assignment of one of three proficiency levels to each domain.
   - Each domain is assigned one of three levels of proficiency - Proficient, Moderately Proficient and Below Proficient - based on the number of questions answered correctly within the domain.
   - This provides direction about where your strengths and weaknesses fall.

PMI defines the levels of "proficiency" as follows:

Proficient - indicates performance is above the average level of knowledge in this domain.
Moderately Proficient - indicates performance that is at the average level of knowledge in this domain.
Below Proficient - indicates performance is below the average level of knowledge in this domain.

For more information regarding the exam domains, please refer to the *PMP Examination Content Outline* under Certification on PMI.org.

PROJECT RISK MANAGEMENT PMI-RMP

RMP OVERVIEW

Price

Member: US$520.00

Non-member: US$670.00

Prerequisites

Secondary degree

(high school diploma, associate's degree, or the global equivalent)

4,500 hours of project risk management experience

40 hours of project risk management education

OR

Four-year degree

(bachelor's degree or the global equivalent)

3,000 hours of project risk management experience

30 hours of project risk management education.

Application (Risk Management Experiences).

Project Name: ----------.
Project Objective: Describe the project in one or tow rows.
Role: Project Manager or Project Engineer.

I lead the following risk management activities

1. Identify risks.
2. Assess and rank risks.
3. Develop risk management strategies.
4. Monitor and reassess risks .
5. Coach & educate stakeholders and project team members in risk principles and implementing risk processes.
6. Asses stakeholders risk tolerance and engage them on risk prioritization.
7. Perform specialized risk analysis using advanced tools & techniques and evaluate the attributes of risks.

The required Materials to Prepare for the Exam

- Review the Exam Content Outline .
- Review the *Practice Standard for Project Risk Management*.
- Review PMBOK5 *A Guide to the Project Management Body of Knowledge* (PMBOK® Guide). Only Ch10 ,Ch11 and Ch13.
- Practice Exams.

How to study the materials

- Studying duration from **one to two months** according to your PMP Certificate date(recent PMP certified or old).
- You have to read the materials **four times** by integration method.

Example for the integration method:

For Identify Risk process, read from (Pmbok5 CH11 + Practice Standard CH5 + Appendix-D D2 + Exam Content Outline) in the same time.

- Solve questions during the reading up to day of the exam.

PROJECT RISK MANAGEMENT PMI-RMP

Exam Content Outline

The following table identifies the proportion of questions from each domain that will appear on the PMI-RMP exam.

Domain	Percentage of Items on Test
Risk Strategy and Planning (5 Tasks)	19–20%
Stakeholder Engagement (9 Tasks)	19–20%
Risk Process Facilitation (7 Tasks)	25–28%
Risk Monitoring and Reporting (7 Tasks)	19–20%
Perform Specialized Risk Analyses (3 Tasks)	14–16%
Total (31 Tasks)	100%

PROJECT RISK MANAGEMENT PMI-RMP

Exam Content Outline

Domain 1: Risk Strategy and Planning

Activities related to developing policies, processes, and procedures for risk assessment, planning, and response.

Tasks	Risk Strategy and Planning (19–20%)
Task 1	Develop risk assessment processes and tools that quantify stakeholder risk tolerances in order to assess and determine risk thresholds for the project and set criteria for risk levels.
Task 2	Update risk policies and procedures using information such as lessons learned from projects and outputs of risk audits in order to improve risk management effectiveness.
Task 3	Develop and recommend project risk strategy based on project objectives in order to establish the outline for the risk management plan.
Task 4	Produce risk management plan for the project on the basis of inputs such as project information, external factors, stakeholder inputs, and industry policies and procedures in order to define, fund, and staff effective risk management processes for the project that align with other project plans.
Task 5	Establish evaluation criteria for risk management processes based on project baselines and objectives in order to measure effectiveness of the project risk process.

PROJECT RISK MANAGEMENT PMI-RMP

Exam Content Outline

Domain 2: Stakeholder Engagement

Activities related to promoting the understanding of project risk management for stakeholders and project team members, assessing stakeholder risk tolerance, prioritizing project risk, and promoting risk ownership.

Tasks	Stakeholder Engagement (19–20%)
Task 1	Promote a common understanding of the value of risk management by using interpersonal skills in order to foster an appropriate level of shared accountability, responsibility, and risk ownership.
Task 2	Train, coach, and educate stakeholders in risk principles and processes in order to create shared understanding of principles and processes, and foster engagement in risk management.
Task 3	Coach project team members in implementing risk processes in order to ensure the consistent application of risk processes.
Task 4	Assess stakeholder risk tolerance using processes and tools such as interviewing stakeholders and reviewing historical stakeholder behaviors in order to identify project risk thresholds.

PROJECT RISK MANAGEMENT PMI-RMP

Exam Content Outline

Tasks	Stakeholder Engagement (19–20%)
Task 5	Identify stakeholder risk attitudes and cognitive biases using stakeholder analysis techniques in order to manage stakeholder expectations and responses throughout the life of the project.
Task 6	Engage stakeholders on risk prioritization process based on stakeholder risk tolerance and other relevant criteria, in order to optimize consensus regarding priorities.
Task 7	Provide risk-related recommendations to stakeholders regarding risk strategy and planning, risk process facilitation, risk reporting, and specialized risk tasks by using effective communication techniques in order to support effective risk-based decision making.
Task 8	Promote risk ownership by proactively communicating roles and responsibilities and engaging project team members in the development of risk responses in order to improve risk response execution.
Task 9	Liaise with stakeholders of other projects by using effective communication techniques and sharing information on project risk performance in order to inform them of implications for their projects.

PROJECT RISK MANAGEMENT PMI-RMP

Exam Content Outline

Domain 3: Risk Process Facilitation

Activities related to facilitating risk identification, evaluation, prioritization, and response among project team members.

Tasks	Risk Process Facilitation (25–28%)
Task 1	Apply risk assessment processes and tools in order to quantify stakeholder risk tolerances and determine risk levels.
Task 2	Facilitate risk identification using a variety of techniques in order to enable the project team and stakeholders to understand and determine the risk exposure of the project.
Task 3	Facilitate the project team's evaluation of the identified risks' attributes using qualitative and quantitative tools and techniques in order to prioritize the risks for response planning.
Task 4	Facilitate the development of an aligned risk response strategy and related risk actions by risk owners from the information gathered during risk analysis in order to ensure timely and defined action when required.

PROJECT RISK MANAGEMENT PMI-RMP

Exam Content Outline

Domain 3: Risk Process Facilitation

Tasks	Risk Process Facilitation (25–28%)
Task 5	Facilitate the formulation of project contingency reserve based on the risk exposure of the project in order to have the capability and resources to respond to realized risks.
Task 6	Provide risk data to cost and schedule analysts/estimators to ensure that project risk is properly reflected in cost and schedule estimates for the project.
Task 7	Use scenarios to validate potential risk responses and evaluate key dependencies and requirements in order to enhance the likelihood of project success.

PROJECT RISK MANAGEMENT PMI-RMP

Exam Content Outline

Domain 4: Risk Monitoring and Reporting

Activities related to monitoring risk, evaluating risk response against established metrics, and communicating risk response performance to stakeholders and project team.

Tasks	Risk Monitoring and Reporting (19–20%)
Task 1	Document and periodically update project risk information using standard tools (including but not limited to risk register, risk database) and techniques in order to maintain a single, current repository of all project risk information.
Task 2	Coordinate with project manager using communication techniques in order to integrate risk management throughout the project.
Task 3	Create periodic standard and custom reports using risk-related metrics as specified in the risk management plan in order to communicate risk management activities and status.

PROJECT RISK MANAGEMENT PMI-RMP

Exam Content Outline

Domain 4: Risk Monitoring and Reporting

Tasks	Risk Monitoring and Reporting (19–20%)
Task 4	Monitor risk response metrics by analyzing risk response performance information, and present to key stakeholders in order to ensure resolution of risk and develop additional risk response strategies to address residual and secondary risks.
Task 5	Analyze risk process performance against established metrics in order to drive risk process improvements.
Task 6	Update the project risk management plan using relevant internal and external inputs in order to keep the plan current.
Task 7	Capture risk lessons learned through comprehensive review of the project risk management plan, risk register, risk audits, risk process performance reports, and other associated reports in order to incorporate into future risk planning.

PROJECT RISK MANAGEMENT PMI-RMP

Exam Content Outline

Domain 5: Perform Specialized Risk Analyses

Activities related to the specialized quantitative and qualitative tools and techniques used by project risk management professionals.

Tasks	Perform Specialized Risk Analyses (14–16%)
Task 1	Evaluate the attributes of identified risks using advanced quantitative tools and specialized qualitative techniques in order to estimate overall risk exposure of the project.
Task 2	Analyze risk data produced during the project using statistical analyses and expert judgment in order to determine strengths and weaknesses of risk strategy and processes and recommend process improvements when indicated.
Task 3	Perform specialized risk analysis using advanced tools and techniques in order to support stakeholder decision making for the project.

PROJECT RISK MANAGEMENT PMI-RMP

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RMP COACH

PROJECT RISK MANAGEMENT Course

PMI-RMP

LESSON 1
INTRUDUCTION

Engr. ALAA SULTAN
Senior Project Manager
PMP, PMI-RMP, OCP, 6SIGMA

LESSON1. INTRODUCTION

CONTENTS

This chapter includes the following sections

0- Standard Concepts.

1- Purpose of the Practice Standard for Project Risk Management.

2- Project Risk Management Definition.

3- Role of Project Risk Management in Project Management.

4- Good Risk Management Practice.

5- Critical Success Factors for Project Risk Management

LESSON1. INTRODUCTION

Refreshment questions

1- Seller A may provides the materials in time with probability 60% and confidence level 55%. Seller B may provides the materials in time with probability 40% and confidence level 90%. You will select ----------.

A) select B because the confidence higher than A.

B) Select A because the probability higher than B.

C) Data insufficient.

D) Select B because the selection based on cumulative value of probability and confidence level.

LESSON1. INTRODUCTION

Refreshment questions

1- Seller A may provides the materials in time with probability 60% and confidence level 55%. Seller B may provides the materials in time with probability 40% and confidence level 90%. You will select ----------.

A) select B because the confidence higher than A.

B) Select A because the probability higher than B.

C) Data insufficient.

D) Select B because the selection based on cumulative value of probability and confidence level.

Answer D.

Seller A : P x C = 0.6 X 0.55 = 0.33

Seller B : P x C = 0.4 X 0.90 = 0.36

0.6×0.55 <0.4X0.9

select seller B.

LESSON1. INTRODUCTION

Refreshment questions

2- Seller A may provides the materials in time with probability 60%, confidence level 75% and total price 550,000. Seller B may provides the materials in time with probability 65 % , confidence level 60% and total price 600,000 Who will be selected if the confidence level of Seller B increased by 10%?.

A) Select A because the selection based one cumulative value of probability, confidence level and price.

B) Select A because the probability higher than B.

C) Data insufficient.

D) Select B because the selection based one cumulative value of probability, confidence level and price.

LESSON1. INTRODUCTION

Refreshment questions

2- Seller A may provides the materials in time with probability 60%, confidence level 75% and total price 550,000. Seller B may provides the materials in time with probability 65 % , confidence level 60% and total price 600,000 Who will be selected if the confidence level of Seller B increased by 10%?.

A) Select A because the selection based one cumulative value of probability, confidence level and price.

B) Select A because the probability higher than B.

C) Data insufficient.

D) Select B because the selection based one cumulative value of probability, confidence level and price.

Correct answer is A:

Seller A =(1 – (P x C))x(price) =(1- (0.6x0.75))x(550000) = 302500.

Seller B =(1 – (P x C))x(price) = (1- (0.65x0.7))x (600000) = 327000

Select the lowest price . Select seller A.

Questions

Contingency Reserve questions

Q2- You are a project manager of a new project for your organization FDR Inc. You and your team calculating the contingency reserve for the project. Reference to the risks in the below table What is the **contingency reserve** of your project ?

A) 120000
B) - 170,460
C) 170,460
D) - 120000.

Risk	Probability	Impact ($)
R1	0.6	-80,000
R2	0.5	-66,000
R3	0.4	-120,000
R4	0.66	-23,000
R5	0.73	-36,000

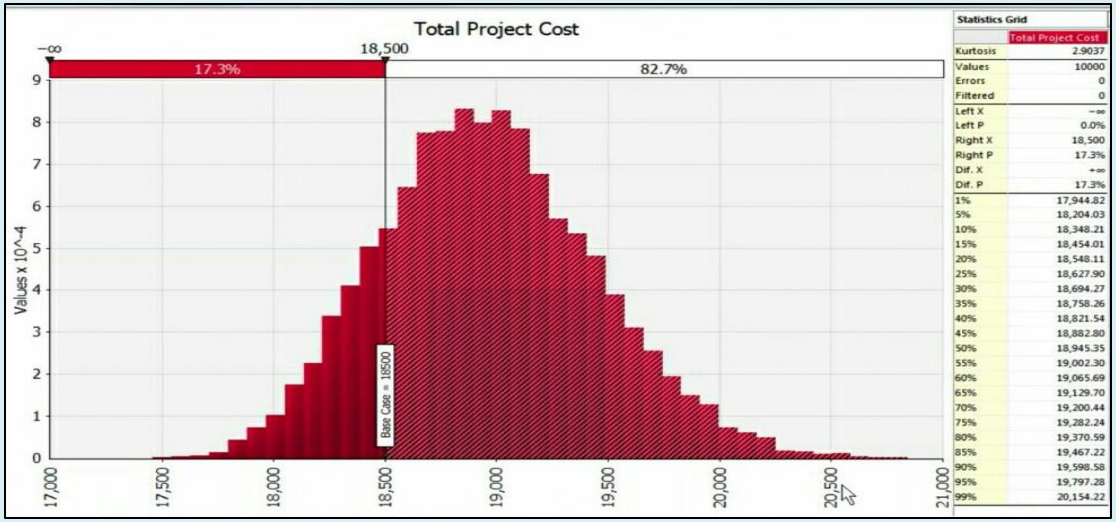
Contingency reserve of the project = CR = EMV = Sum (P x I) =
- (0.6 x80,000 + 0.5 x66.000 + 0.4 x 120,000 + 0.66 x 23,000 + 0.73 x 36,000) = -170,460 .
So the contingency reserve of the project = CR =170,460.
Correct answer is C.

Questions

ABC is a big Organization working in Construction by old style, they got new project **with Total Cost 18,821,540$** the customer requests to work by the Up to date style and announced that the risk management very important for project success. Therefore the organization hired a subject matter Expert to work as Risk manager during the project life cycle.

The Sponsor, Project manager and the risk manager in the meeting, then the Risk manager open the Lap top to explain the benefits of risk management and how and when should be implemented, during the presentation the sponsor notice a complicated graphics, he ask the Risk manager, what is this ,he told Mote Carlo Simulation technique as below. The risk manager explained the technique then the Sponsor asked him. **What is the probability of achieving the planned cost objective?** The values in the graph by thousands.

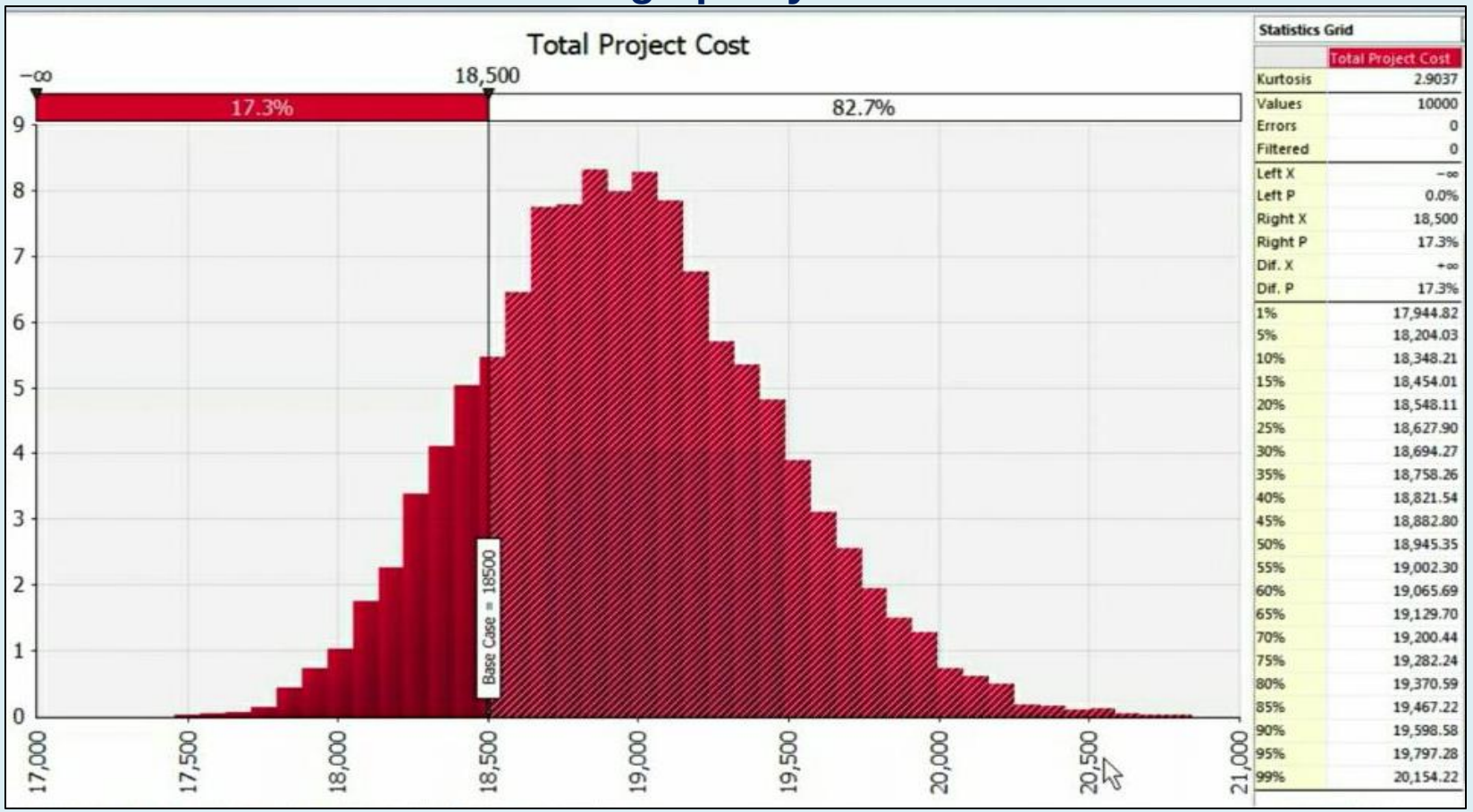
A) 40%.
B) 50%.
C) 80%.
D) 30%.



Questions

Q1) Total Cost 18,821,540. What is the probability of achieving the planned cost objective? **The values in the graph by thousands.**

A) 40%
B) 50%
C) 80%
D) 30%



Statistics Grid	Total Project Cost
Kurtosis	2.9037
Values	10000
Errors	0
Filtered	0
Left X	−∞
Left P	0.0%
Right X	18,500
Right P	17.3%
Dif. X	+∞
Dif. P	17.3%
1%	17,944.82
5%	18,204.03
10%	18,348.21
15%	18,454.01
20%	18,548.11
25%	18,627.90
30%	18,694.27
35%	18,758.26
40%	18,821.54
45%	18,882.80
50%	18,945.35
55%	19,002.30
60%	19,065.69
65%	19,129.70
70%	19,200.44
75%	19,282.24
80%	19,370.59
85%	19,467.22
90%	19,598.58
95%	19,797.28
99%	20,154.22

From the graph check the probability beside 18,821,540 = 40%
Correct Answer is A

LESSON1. INTRODUCTION
1.0 STANDARD CONCEPTS

PMI practice standards:

- Guides to the use of a tool, technique, or process identified in *PMBOK or* other PMI standards.

- Does not prescribe **how** the process is to be implemented, leaving that subject for handbooks, manuals, and courses.

Practice Standards Audiences

- Are targeted who participate in the management of projects. **This includes :**

  - Project managers.
  - Project personnel.
  - Contract personnel.
  - Supervisors.
  - Other project stakeholders.

LESSON1. INTRODUCTION
1.0 STANDARD CONCEPTS

PMI practice standard
describes processes, activities, inputs, and outputs
for a specific Knowledge Area.

It provides information on process, tool, or technique

- **what** is the significant.
- **what** it does
- **why** it is significant
- **when** it should be performed or executed
- **who** should perform the process.

LESSON1. INTRODUCTION

1.1 Purpose of the Practice Standard for Risk Management

A- Provide a standard for

project management practitioners and other stakeholders that defines the aspects of Project Risk Management that are **recognized as good practice on most projects most of the time**.

Most Projects

B- Provide a standard:

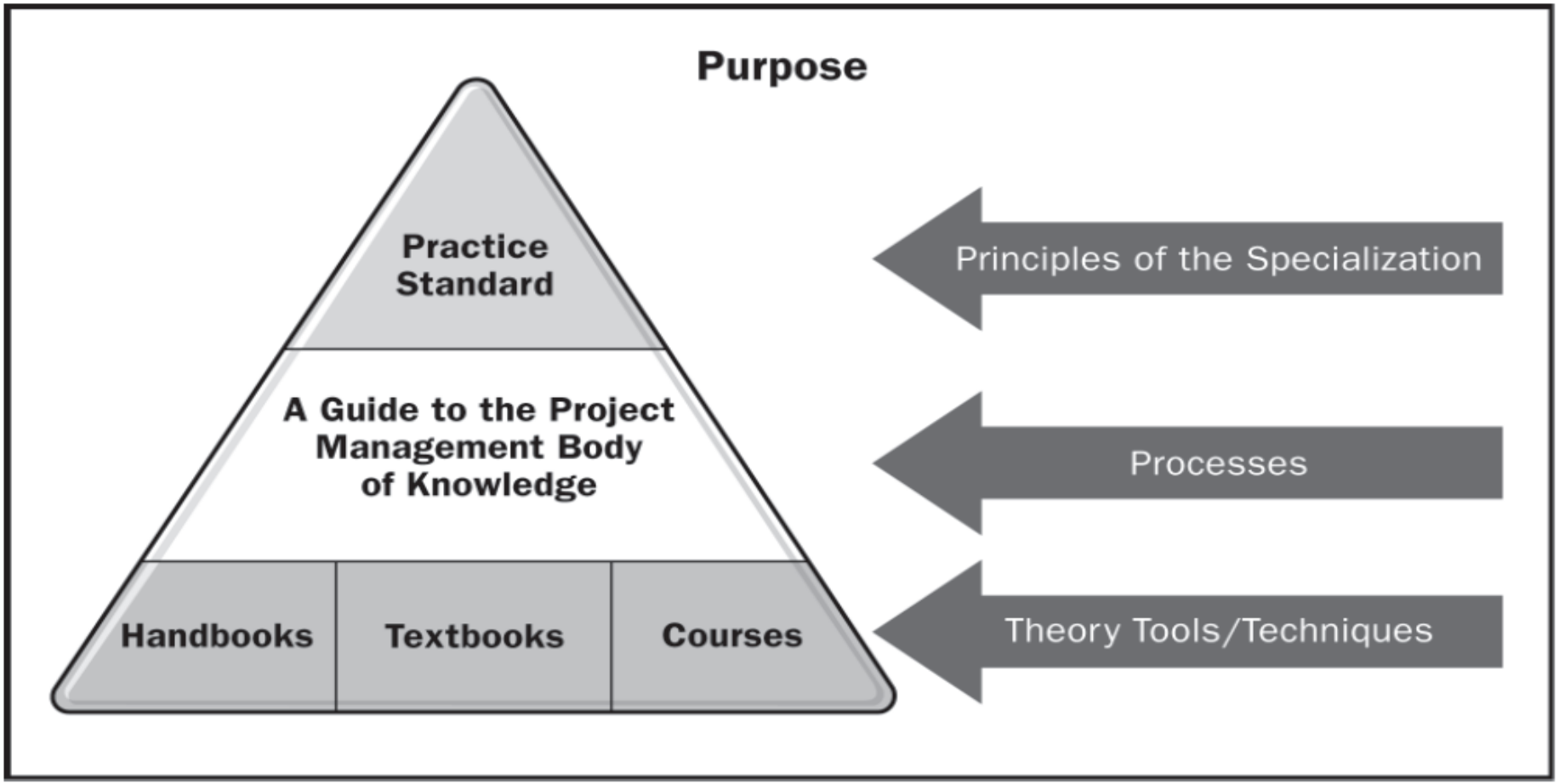
- Globally applicable.
- Descriptive purpose rather than one used for training or educational purposes.

❖ The Practice Standard covers risk management **in single projects** only, does **not** cover risk in **programs or portfolios.**

LESSON1. INTRODUCTION

1.1 Purpose of the Practice Standard for Risk Management

compares the purposes of the practice standard to those of the *PMBOK* and textbooks, handbooks, and courses.



LESSON1. INTRODUCTION

1.1 Purpose of the Practice Standard for Risk Management

- **The practice standard** emphasizes some **principles** that are **fundamental** to **effective, comprehensive, and successful** Project Risk Management.
- **Different projects, organizations, and situations will require different approaches to Project Risk Management.**
- **Risk management** is a discipline that contains **a series of processes to apply to both large and small projects.**
- **Risk management** will be **more effective** if its practice **is tailored** to the project and **compatible** with the organizational **culture, processes and assets.**

LESSON1. INTRODUCTION

1.1 Purpose of the Practice Standard for Risk Management

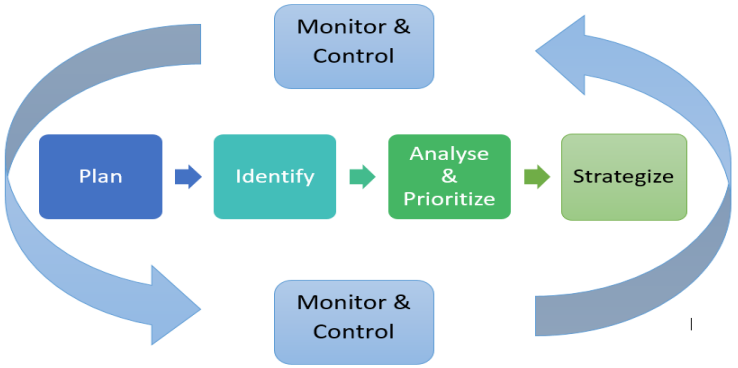
➢**Project Risk Management principles are applicable** to projects carried out in a **global context**, reflecting the **many business and organizational arrangements** between participants. **Examples**:-

- **Joint ventures between commercial and national companies.**
- **Government and non-government organizations.**
- **Cross-cultural environment often found on these project teams.**

➢**Practitioners can establish processes specific to their particular situation, project, or organization and then compare them with these principles. thus validating them against good Project Risk Management practice.**

Project Risk Management Definition

Project Risk Management includes the processes concerned with conducting risk management planning, identification, analysis responses, and monitoring and control on a project.



Objectives of Project Risk Management:

Increase the probability and impact of positive events, and decrease the probability and impact of negative events in the project.

LESSON1. INTRODUCTION

1.2 Project Risk Management Definition

Project risk :

An uncertain event or condition that, if it occurs, has a positive or negative effect on a project's objectives(scope, schedule, cost, and quality) .

Project Risk Management aims to :

Identify and prioritize risks in advance of their occurrence, and provide action information to project managers. This actions require consideration of events that may or may not occur and are therefore described in terms of likelihood or probability of occurrence and their impact on objectives.

LESSON1. INTRODUCTION

1.3 Role of Risk Management in Project Management

- Project Risk Management is **not an optional** activity It is **essential** to successful project management.

ESSENTIAL NOT OPTIONAL

- It should be **applied to all projects** and hence be included in project plans and operational documents.

APPLIED TO ALL PROJECTS

- It is an **integral part of every aspect** of managing the project, in every phase and in every process group.

INTEGRAL PART OF EVERY ASPECT

- Project Risk Management addresses the uncertainty in project estimates and assumptions.

UNCERTAINTY IN ESTIMATES& ASSUMPTIONS.

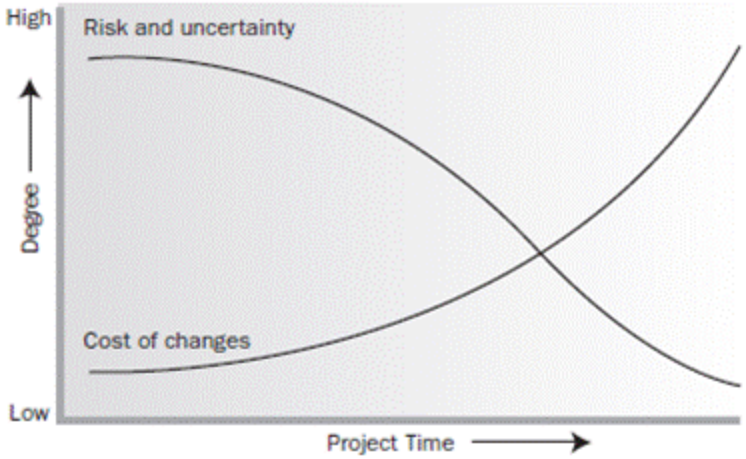
- Project Risk Management is not a substitute for the other project management processes.

NOT SUBSTITUTE FOR OTHER PROCESSES.

- Project Risk Management a valuable component and adds the perspective of project risk to the outputs of other processes adds to their value by taking risk into account.

VALUABLE COMPONENT ADDS VALUES TO OTHER PROCESSES

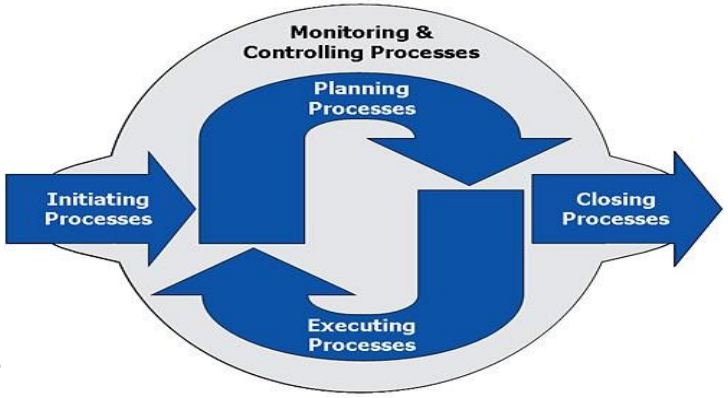
- In the early stages of a project, the level of risk exposure is at its maximum but information on the project risks is at a minimum.



LESSON1. INTRODUCTION

1.3 Role of Risk Management in Project Management

- A risk management is applicable **throughout a project's life cycle**.



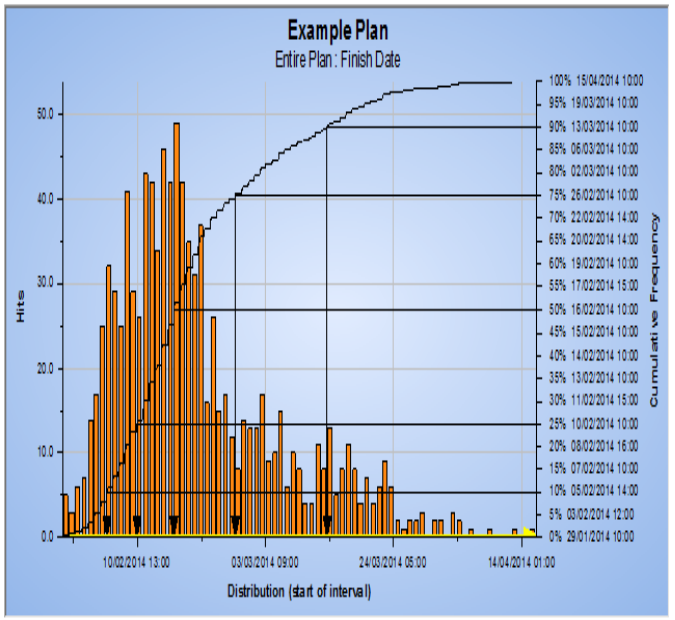
- The **earlier** in the project life cycle that the risks are recognized, the more **realistic** the project plans and expectations of results will be.

- Risk management processes **monitor the changes** in the project **for new risks** that may emerge so that **appropriate responses** to them can be developed, as well as **check for existing risks** that are no longer active.

LESSON1. INTRODUCTION

1.3 Role of Risk Management in Project Management

- Project Risk Management plays a role in **providing realistic expectations** for the **completion dates** and **cost** of the project.



- Throughout the project and during project closure, **risk-related lessons** are **reviewed** in order to **contribute** to organizational learning and **support** continuous **improvement** of Project Risk Management practice.

LESSON1. INTRODUCTION

1.4 Good Risk Management Practice

- Project Risk Management should be conducted in a manner consistent with existing organizational practices and policies.

CONSISTENT WITH ORGANIZATIONAL PRACTICES AND POLICIES.

- Project Risk Management should be conducted in a way that is appropriate to the project.

CONDUCTED APPROPRIATE TO THE PROJECT.

LESSON1. INTRODUCTION

1.4 Good Risk Management Practice

- Changes in the project management plan that result from the Project Risk Management process may require decisions at the appropriate level of management to:

  - Reassign personnel.
  - Establish or modify budgets.
  - Make commitments to others outside the project.
  - Interact with regulators.
  - Comply with the rules of accounting and law.

LESSON1. INTRODUCTION

1.4 Good Risk Management Practice

- Project Risk Management should always be conducted on an ethical basis, in keeping with the Project Management code of ethics or conduct.

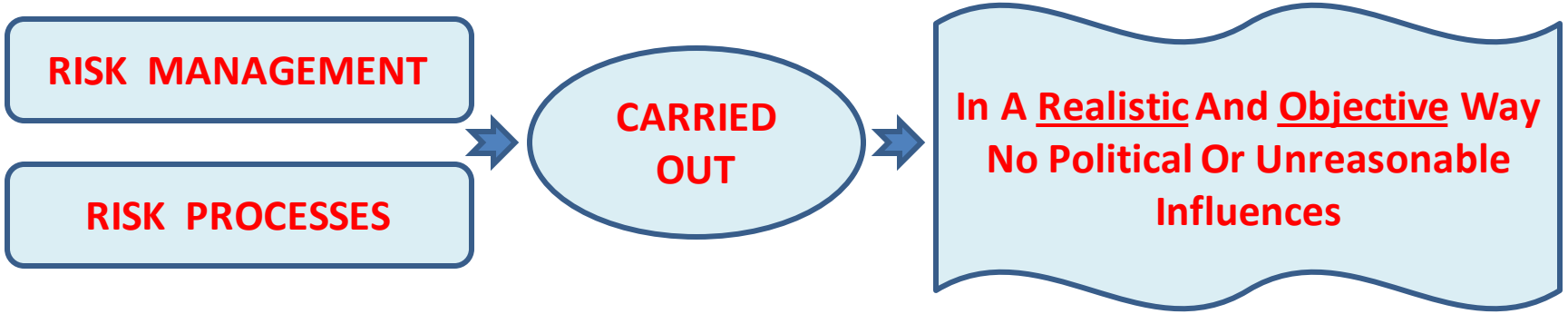
- Honesty, responsibility, realism, professionalism and fair in dealing with others are among the characteristics of successful Project Risk Management.

LESSON1. INTRODUCTION

1.4 Good Risk Management Practice

- Effective Project Risk Management benefits from strong communication and consultation with stakeholders.

- This enables agreement among stakeholders that Project Risk Management in general, and risk identification, analysis, and response, in particular, should be carried out in a realistic and objective way and should not be subject to political or other unreasonable influences.



LESSON1. INTRODUCTION

1.4 Good Risk Management Practice

- Project Risk Management should be conducted on all projects.

CONDUCTED ON ALL PROJECTS LARGE AND SMALL

- The degree, level of detail of tools, and amount of time and resources applied to Project Risk Management according to the value and the size of the project.

VALUE AND THE SIZE OF THE PROJECT.

DEGREE, LEVEL OF DETAIL OF TOOLS, AMOUNT OF TIME AND RESOURCES

- Project Risk Management processes should be scaled to be appropriate to the project during the Plan Risk Management process.

RISK PROCESSES SHOULD BE SCALED TO BE APPROPRIATE TO THE PROJECT

LESSON1. INTRODUCTION

1.5 Critical Success Factors for Project Risk Management

1- Recognize the Value of Risk Management

Project Risk Management should be recognized because it provides a positive effects for :

- **Organizational management.**
- **Project stakeholders (both internal and external).**
- **Project management.**
- **Team members.**

Recognize The Value

2- Individual Commitment/Responsibility

Project participants and stakeholders should all accept responsibility for undertaking risk-related activities as required.
Risk management is everybody's responsibility.

Individual Commitment/ Responsibility

3- Open and Honest Communication

Everyone should be involved in the Project Risk Management process. Any actions or attitudes that hinder communication about project risk reduce the effectiveness of Project Risk Management.

Open And Honest Communication

4- Organizational Commitment

- **Established if risk management is aligned with the organization's goals and values.**
- **Project Risk Management may require a higher level of managerial support because handling some of the risks will require approval of or responses from levels above the project manager.**

Organizational Commitment

5- Risk Effort Scaled to Project

- Project Risk Management activities should be consistent with the value of:
  - Project to the organization
  - level of project risk and scale.
  - Organizational constraints.
- Cost of Project Risk Management should be appropriate to its potential value to the project and the organization.

Risk Effort Scaled to Project

6- Integration with Project Management

Project Risk Management does not exist in a vacuum, isolated from other project management processes.

Successful Project Risk Management requires the correct execution of the other project processes.

Integration with Project Management

LESSON1. INTRODUCTION

1.6 Questions

Q1 - The Practice Standard for Project Risk Management covers risk management in ----------.

A- single projects only.
B- programs or portfolios of projects.
C- Projects ,Programs and Portfolios.
D- Programs only.

Correct answer is A.

The Practice Standard covers risk management **in single projects** only, does **not** cover risk in **programs or portfolios.**

Q2 - A PMI practice standard describes processes, activities, inputs, and outputs for ----------.
A- Processes Group.
B- Specific Knowledge Area.
C- All Knowledge Areas.
D- All Processes Groups.

Correct answer B.
A PMI practice standard describes processes, activities, inputs, and outputs for a specific Knowledge Area

Q3 - Which one of the following provides information on what the significant process, tool, or technique is, what it does, why it is significant, when it should be performed or executed, and, who should perform the process?
A- PMBOK.
B- A PMI Standard.
C- Texts sheets.
B- Manuals.

Correct answer B.

PMI practice standard provides information on what the significant process, tool, or technique is, what it does, why it is significant, when it should be performed or executed, and, if necessary for further clarification, who should perform the Process.

Q4 - The PMI practice standard describes or provides all the following, EXCEPT:

A. Sets down rules and guidelines for process implementation.

B. Creates highly planned and controlled tools and techniques for projects.

C. Does not necessary mirrors the life-cycle and knowledge areas of a project.

D. Inclusion of processes applicable and restricted to application areas for project knowledge.

Correct answer A.

PMI practice standard Does not prescribe how the process is to be implemented, leaving that subject for handbooks, manuals, and courses.

Q5 – Practice standards are targeted at audiences such as:

A- Individuals and groups of people who seek a standard that is globally accepted and consistently applied.

B- Businessmen who need standards for implementing and solving problems.

C- Professional practitioners, stakeholders, and developers of project management concentrating on a specific knowledge area.

D- Project managers, project personnel, contract personnel, supervisors, and other project stakeholders.

Correct answer is D

Practice standards are targeted at audiences who participate in the management of projects. This includes project managers, project personnel, contract personnel, supervisors, and other project stakeholders.

Q6 - The purpose of the Practice Standard for Risk Management is to:

A- Provide standard guidelines for significant processes relevant to risk management.
B- Cover risk in programs or portfolios of projects.
C- Provide a global and consistent standard that defines the aspects of Project Risk Management for practitioners and stakeholders.
D- Depict risks associated with the life-cycle phases of projects.

Correct answer is C.
The purpose of the Practice Standard for Project Risk Management is to provide a standard for project management practitioners and other stakeholders that defines the aspects of Project Management that are recognized as good practice on most projects most of the time and provide a standard that is globally applicable and consistently applied.

❑Q7- Project Risk Management is essential to all project. Which one of the following options is wrong ?

A- Different projects, organizations, and situations will require different approaches to Project Risk Management.

B- Similar approaches of Project Risk Management are required to all projects.

C- Project Risk Management is integral part of project management.

D- Project Risk Management is iterative throughout the project live cycle.

Correct Answer is B.

Because different approaches of Project Risk Management are required to different projects, organizations, and situations.

LESSON1. INTRODUCTION

1.6 Questions

Q8- The Project Risk Management includes processes concerned with -------.

A- Planning, identification, analysis, responses, monitoring, and control of risks on a project.
B- Planning, implementation, monitoring and control of risks on a project.
C- Identification of risks on a project.
D- Analyzing the impact of identified risks on a project.

Correct Answer is A.
Project Risk Management includes processes concerned with conducting risk management planning, identification, analysis, responses, monitoring and control on a project.

Q9- You are a project manager in your organization. You are discussing with your project team the concepts and objectives of the project risk management .What are the objectives of project Risk management?

A- Enhance the probability and impact of positive events, and enhance the probability and impact of negative events in the project.

B- Enhance the probability and impact of positive events, and mitigate the probability and impact of negative events in the project.

C- Increase the probability and impact of positive events, and decrease the probability and impact of negative events in the project.

D- Exploit the probability and impact of positive events, and avoid the probability and impact of negative events in the project.

Correct answer is C.

The objectives of Project Risk Management are to increase the probability and impact of positive events, and decrease the probability and impact of negative events in the project. Page 4 in Practice standard for project risk management.

Q10- You are a project manager in your company. The Sponsor of your new project informed you that no need to waste time in Risk management since the project is small. What is your decision?

A- Start immediately plan risk management process because you are the project manager.

B- Start the project without risk management according to the Sponsor instructions.

C- Agreed with the sponsor because the project is small so no need for risk management.

D- Meet the sponsor and explain to him the benefits of risk management as well as the risk management is essential not optional to all projects.

Correct answer is D.

Project Risk Management is not an optional activity; it is essential to successful project management. It should be applied to all projects.

Reference is Practice standard for risk management page#4.

LESSON1. INTRODUCTION

1.6 Questions

Q11- You are a project manager in your company. You have a new project, now in the planning stage and the Sponsor discuss with you that the project is behind schedule and no time for Risk management. What is your decision?
A- Start plan risk management.
B- Start the project without risk management and save time.
C- Hire Subject matter expert (Consultant) to start risk management.
D- Most of the project considers risk management is optional.

Correct answer is C.
Project Risk Management is not an optional activity: it is essential to successful project management. It should be applied to all projects.
Reference is practice standard for project risk management page#4.

Q12- Which one of the following statements on Project Risk Management in Project Management is wrong?

A- It is an integral part for every project and each phase of the process group.

B- It provides realistic expectations for the completion of dates and cost of the project.

C- It addressed the uncertainty in project estimates and assumptions.

D- It is a substitute for other project management processes.

Correct answer is D.

Project Risk Management is not a substitute for other project management processes such as scheduling, budgeting, and change management

Q13- Which of the following is a critical success factor for Project Risk Management?

A- Individual Commitment/Responsibility

B- Non-scalability of risk efforts to Project Management.

C- Team members and stakeholders motivation.

D- Non-integration of risk management with Project Management.

Correct answer is A.

Individual Commitment/Responsibility is a CSF of Project Risk Management.

Q14- Which of the following conditions, ensures that risk management is effective?

A- If it is tailored to the project and compatible with the organizational culture, processes and assets.

B- If it is carried out by risk experts.

C- If appropriate amount of contingency fund is allotted to the project.

D- If the day-to-day management of project by project manager is overseen by the project board.

Correct answer is A:

Risk management will be more effective if its practice is tailored to the project and compatible with the organizational culture, processes and assets.

Q15- What is Project Risk?

A- Project Risk is the predictable risk that can occur during the course of a project, which has a negative or positive effect on the project's objective.
B- Project Risk is an uncertain event or condition that, if it occurs, has a positive or negative effect on a project's objectives.
C- Project Risk is defined as the risks that will create a positive/negative influence on Project Management.
D- Project Risk is an uncertain event or condition that, if it occurs, has little or no effect on a project's objectives.

Correct answer is B.
In the PMBOK® Guide – Fifth Edition, "project risk is an uncertain event or condition that, if it occurs, has a positive or negative effect on a project's objectives." Project objectives include scope, schedule, cost, and quality.

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PROJECT RISK MANAGEMENT

Course

PMI-RMP

LESSON 2

Principles And Concepts

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1-Definition of Project Risk

What is Project risk?

- Project risk is an **uncertain** event or condition that, if it occurs, has a positive or negative effect on one or more project objectives such as scope, schedule, cost, quality and performance.

- A risk may have one or more causes and, if it occurs, it may have one or more impacts.

1-Definition of Project Risk

Risks

Threats or Negative Risks

Threats which occur called issues or problems, have a negative effect on the project objectives.

Opportunities or Positive risks

Opportunities which occur may be called benefits, have a positive effect on the project objectives.

LESSON2. PRINCIPLES AND CONCEPTS

1-Definition of Project Risk

It is important to distinguish between Risks, Causes, Effects and Impacts.

- **Risks**

  Are uncertain future events or conditions which may or may not occur, but which would matter if they did occur.

- **Causes**

  Events or circumstances which currently exist or are certain to exist in the future and which might give rise to risks.

- **Effects**

  Are conditional future events or conditions which would directly affect one or more project objectives if the associated risk occurs.

- **Impacts**

  A measure of the effect of a risk on one or more objectives if it occurs

- **Structured risk statement (Meta-Language)**

  "Because of <one or more causes>, <risk> might occur, which would lead to <one or more effects>".

Individual risks

- Specific events or conditions that might affect project objectives, may positively or negatively affect one or more of the project objectives, elements, or tasks.
- Understanding individual risks can assist in determining how to apply effort and resources to enhance the chances of project success.
- Day-to-day Project Risk Management focuses on these individual risks in order to enhance the project success.

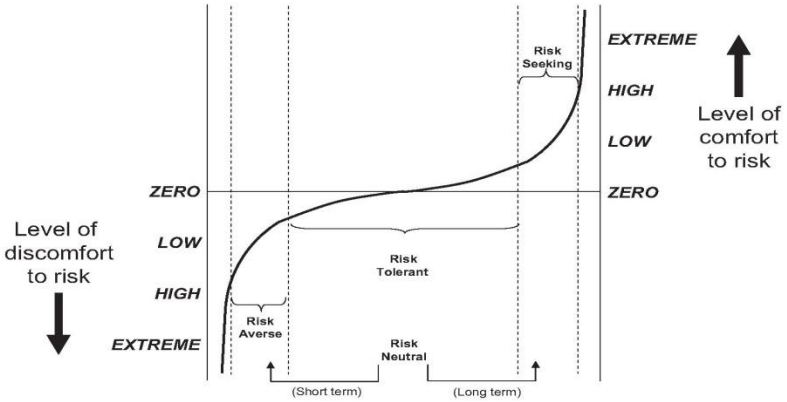
Overall risks

Represents the effect of uncertainty on the project as a whole.

- Overall project risk is more than the sum of individual risks on a project, since it applies to the whole project.
- Represents the exposure of stakeholders to the implications of variations in project outcome.
- It is an important component of strategic decision-making by program and portfolio management and project governance where investments are sanctioned or cancelled and priorities are set.
- At the higher level, it is necessary to set realistic cost and duration of a project, establish the contingency reserve levels required to protect the project stakeholders, set appropriate project priorities, and judge whether the risk of overall success is increasing or decreasing as implementation advances.

Risk Attitude

A chosen mental disposition towards uncertainty, adopted explicitly or implicitly by individuals and groups, driven by perception, and evidenced by observable behavior. Risk attitude exists on a continuous spectrum, but common risk attitudes include risk averse, risk tolerant, risk neutral and risk seeking.



- The risk attitudes of the project stakeholders determine the extent to which an individual risk or overall project risk matters

LESSON2. PRINCIPLES AND CONCEPTS

3-Stakeholder Risk Attitudes

- Understanding stakeholders Risk attitudes is an important component of risk management planning that precedes risk identification and analysis, in order to optimize both project success and stakeholder satisfaction with the project's results.
- Attitudes should be identified and managed proactively and updated throughout the Project Risk Management process.
- Attitudes may differ from one project to another for the same stakeholders
- Attitudes usually differ from one group of stakeholders to another.
- Single stakeholder may adopt different risk attitudes at various stages in the same project.

3-Stakeholder Risk Attitudes

Risk Attitudes Type

Risk Averse	Risk Seeking	Risk Neutral	Risk Tolerant
•They don't like to take risk. •They unwilling to take risks. •They want to avoid risks as much as possible. • They prefer a more certain outcome	•They like to take risks. • Prefer the more uncertain outcome and may be willing to pay a penalty to take a risk.	•Neither risk seeker nor Averse. • Deal objectively with risks. • Analyze the risk (decision tree analysis and EMV) then take decision.	•Very conformable with ignoring the risk. •They don't care and never pay any attention to risks until becomes an issue.

Factors Influence Risk Attitude

- Scale of the project within the range of stakeholders' overall activities.
- Strength of public commitments made about the performance of the project.
- Stakeholders' sensitivity to issues such as environmental impacts, industrial relations, and other factors.

Other Factors Influence Risk Attitude

Risk Appetite

The degree of uncertainty an entity is willing to take on in anticipation of a reward.

Risk Tolerance

The degree, amount, or volume of risk that an organization or individual will withstand.

Risk threshold

Refers to measures along the level of uncertainty or the level of impact at which a stakeholder may have a specific interest. Below that risk threshold, the organization will accept the risk. Above that risk threshold, the organization will not tolerate the risk.

LESSON2. PRINCIPLES AND CONCEPTS

4- Iterative Process

- The amount of information available about risks will usually increase as time goes on.
- Some risks will occur while others will not, new risks will arise or be discovered, and the characteristics of those already identified may change.
- The Project Risk Management processes should be repeated and the corresponding plans progressively elaborated throughout the lifetime of the project.
- To ensure that Project Risk Management remains effective, the identification and analysis of risks should be revisited periodically.

4- Iterative Process

- The progress on risk response actions should be monitored, and the action plans adjusted accordingly.

- If external circumstances change significantly, it may also be necessary to revisit the risk management planning process.

- The frequency and depth of reviews and updates will depend on.
  - The nature of the project.
  - The volatility of the environment in which the project is being implemented.
  - The timing of other project management reviews and updates.

LESSON2. PRINCIPLES AND CONCEPTS

5- Communication

- **Project Risk Management cannot take place in isolation. Success relies heavily on communication throughout the process.**

- **Risk identification and analysis depend on comprehensive input from stakeholders in a project to ensure that nothing significant is overlooked and that risks are realistically assessed.**

- **This demands effective and honest communication from the Project Risk Management process to the rest of the project team and other project stakeholders.**

- **Communication of the results of the Project Risk Management process**

  - **should be targeted to meet the specific needs of each stakeholder.**
  - **should be reflected within the communication management plan with each stakeholder's responsibility and role in risk management identified and agreed-upon.**

6-Responsibility for Project Risk Management

Risk management is everyone's responsibility

- **Project Risk Management should be included as an integral part of all other project processes.**
- **Since project risks can affect project objectives, anyone with an interest in achieving those objectives should play a role in Project Risk Management.**
- **The roles depend on the project team members' and other stakeholders' place within the project and their relation to project objectives.**
- **Roles and responsibilities for Project Risk Management should be clearly defined and communicated, and individuals should be held responsible and accountable. Examples**
  - **For specific activities within the risk process.**
  - **For actions required to implement agreed-upon responses.**
  - **Responsibility for ensuring that risk-related lessons are captured for future use.**

7- Project Manager's Role in Project Risk Management

Project Manager's Role for Overall Project

- The project manager has overall responsibility for delivering a successful project objectives.
- The project manager is accountable for the day-to-day management of the project, including effective risk management.

Project Manager's Role for Project Risk Management

- **Encouraging senior management support for Project Risk Management activities.**
- **Determining the acceptable levels of risk for the project in consultation with stakeholders.**
- **Developing and approving the risk management plan.**
- **Promoting the Project Risk Management process for the project.**
- **Facilitating open and honest communication about risk within the project team and with management and other stakeholders.**

7- Project Manager's Role in Project Risk Management

- Participating in all aspects of the Project Risk Management process.
- Approving risk responses and associated actions prior to implementation.
- Applying project contingency funds to deal with identified risks that occur during the project.
- Overseeing risk management by subcontractors and suppliers.
- Regularly reporting risk status to key stakeholders, with recommendations for appropriate strategic decisions and actions to maintain acceptable risk exposure.
- Escalating identified risks to senior management where appropriate, such: risks outside the authority or control of the project manager, risks required input or action from outside the project, and risks required release of management reserve funds.
- Monitoring the efficiency and effectiveness of the Project Risk Management process.
- Auditing risk responses for their effectiveness and documenting lessons learned.

LESSON2. PRINCIPLES AND CONCEPTS

questions

1- Your organization is very comfortable with ignoring risks, They don't care and never pay any attention to a risk until it becomes an issue. What is the attitude of your Organization?

A- Risk Seeker.

B- Risk Tolerant.

C- Risk Avers

D- Risk Neutral.

LESSON2. PRINCIPLES AND CONCEPTS

questions

1-Your organization is very comfortable with ignoring risks, They don't care and never pay any attention to a risk until it becomes an issue. What is the attitude of your Organization?

A- Risk Seeker.
B- Risk Tolerant.
C- Risk Avers
D- Risk Neutral.

Correct answer is B.
Risk Tolerant is very conformable with ignoring the risk; they don't care and never pay any attention to risks until becomes an issue.

LESSON2. PRINCIPLES AND CONCEPTS
questions

2- Your organization, they don't like to take any risks. What is the attitude of the organization?

A- Risk seeker.

B- Risk Avers.

C- Risk tolerant.

D- Risk neutral.

questions

2- Your organization, they don't like to take any risks. What is the attitude of the organization?

A- Risk seeker.

B- Risk Averse.

C- Risk tolerant.

D- Risk neutral.

Correct answer is B.

Risk Averse=Risk Averter=Risk Avoider. They don't like to take risk, they unwilling to take risks, they wanting to avoid risks as much as possible and they prefer a more certain outcome.

questions

3- A degree of uncertainty that your organization is willing to take on in anticipation of a reward. What is that degree?

A- Risk attitude.

B- Risk tolerance.

C- Risk appetite.

D- Risk Threshold.

LESSON2. PRINCIPLES AND CONCEPTS questions

3- A degree of uncertainty that your organization is willing to take on in anticipation of a reward. What is that degree?
A- Risk attitude.
B- Risk tolerance.
C- Risk appetite.
D- Risk Threshold.

Correct answer is C.
Risk appetite, which is the degree of uncertainty an entity, is willing to take on in anticipation of a reward. The reference is PMBOK page #311.

LESSON2. PRINCIPLES AND CONCEPTS
questions

4- Michael is a project manager of a big project for his organization. The sponsor discusses with Michael about the importance of risk management in the project and the Project Manager's role for the project risk management. Within the above context what is the project manager's role for risk management?

A- Developing and approving the risk management plan, Participating in all aspects of the Project Risk Management process, Approving risk responses and associated actions prior to implementation and auditing risk responses for their effectiveness and documenting lessons learned.

B- Developing and approving the risk management plan, Participating in all aspects of the Project Risk Management process, Approving risk responses and teaching PMO the risk management aspects and auditing risk responses for their effectiveness and documenting lessons learned.

C- Developing and approving the risk management plan, Participating in all aspects of the Project Risk Management process, Approving risk responses and associated actions prior to implementation and auditing risk responses for their effectiveness and assign project managers for other project.

D- Developing and handling the management reserve, Participating in all aspects of the Project Risk Management process, Approving risk responses and associated actions prior to implementation and auditing risk responses for their effectiveness and documenting lessons learned.

LESSON2. PRINCIPLES AND CONCEPTS questions

4- Michael is a project manager of a big project for his organization. The sponsor discusses with Michael about the importance of risk management in the project and the Project Manager's role for the project risk management. Within the above context what is the project manager's role for risk management?

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C- Developing and approving the risk management plan, Participating in all aspects of the Project Risk Management process, Approving risk responses and associated actions prior to implementation and auditing risk responses for their effectiveness and assign project managers for other project.

D- Developing and handling the management reserve, Participating in all aspects of the Project Risk Management process, Approving risk responses and associated actions prior to implementation and auditing risk responses for their effectiveness and documenting lessons learned.

Correct answer is A.

Project Manager's role for the project risk management. Reference is practice standard for project risk management page#12

B is wrong PM cannot teach the PMO. C is wrong PM cannot assign project managers for other projects. D is wrong PM cannot handle the management reserve.

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PROJECT RISK MANAGEMENT Course

PMI-RMP

LESSON 3
Introduction To Project Risk Management

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1- Project Risk Management and Project Management

- All projects are uncertain since projects are unique and temporary undertakings based on assumptions and constraints.
- Project Risk Management provides an approach by which uncertainty can be understood, assessed, and managed within projects.
- Project Risk Management is an integral part of project management.
- Effective Project Risk Management is a critical success factor for project success.
- Project Risk Management is not an optional process or performed as an additional overhead task, It is essential for all projects large and small projects.

1- Project Risk Management and Project Management

- **Effective Project Risk Management requires input from other project management processes, outputs such as:**
  - **Work breakdown structure (WBS).**
  - **Estimates.**
  - **Project schedule.**
  - **Assumptions list, etc.**

- **Project management effectiveness is increased by using the information and results(outputs) from Project Risk Management.**

- **The outputs of Project Risk Management impact the following.**
  - **Estimating resource requirements, cost, or duration.**
  - **Assessing the impact of proposed scope changes.**
  - **Planning or re-planning the forward strategy of the project.**
  - **Allocating resources to tasks.**
  - **Reporting progress to stakeholders, etc.**

2- Project Risk Management Processes

- **project risk** is an uncertain event or condition that, if it occurs, has a positive or negative effect on a project's objectives. From this definition, it is clear that **risks only exist in relation to objectives**.

- It is essential **at the start** of the Project Risk Management process to clearly **define the objectives.**

- Different projects are exposed to different levels of risk, so each step in the Project Risk Management process should be scalable to meet the varying degrees of risk. **Scalable elements of the process include:**
  - Available resources.
  - Methodology and processes used.
  - Tools and techniques used.
  - Supporting infrastructure.
  - Review and update frequency.
  - Reporting requirements.

2- Project Risk Management Processes

- **Risk thresholds** is a precondition for a successful Project Risk Management.

- **Risk thresholds** define the key stakeholders' views on **acceptable levels** of risk, as well as a framework against which identified risks can be assessed.

- Project Risk Management process always starts with an **initiation step** in order to **ensure** a **common understanding** and **agreement** of the team and other stakeholders on the following:
  - Risk Management approach.
  - Parameters that will be applied in managing risk in this project.
  - Project Risk Management process Scope and objectives.

2- Project Risk Management Processes

NOTE: **Project Risk Management activities, resources, and attention should be appropriate to the project since different projects have different levels of risk management application.**

The main actions to provide the required tailoring are as follows:

- **Define objectives against which risks will be identified.**
- **Define how the elements of the Project Risk Management process will be scaled for this project.**
- **Define risk thresholds, tolerances, and the assessment framework.**

- **The outputs from this initial step should be documented, communicated, and then reviewed by the stakeholders to ensure a common understanding of the scope and objectives for the Project Risk Management process.**

- **The document should be formally approved at a senior level.**

2- Project Risk Management Processes

- **Project Risk Management activities, resources, and attention should be appropriate to the project since different projects have different levels of risk management application.**

- **The main actions to provide the required tailoring are as follows:**
  - **Define objectives against which risks will be identified.**
  - **Define how the elements of the Project Risk Management process will be scaled for this project.**
  - **Define risk thresholds, tolerances, and the assessment framework.**

- **The outputs from this initial step should be documented, communicated, and then reviewed by the stakeholders to ensure a common understanding of the scope and objectives for the Project Risk Management process.**

- **The document should be formally approved at a senior level.**

2- Project Risk Management Processes

1- Plan Risk Management.

- Defining how to conduct risk management activities for a project.
- Defines the scope and objectives of the Project Risk Management process.
- Ensures that the risk process is fully integrated into project management plan.

2- Identify Risks.

determining which risks may affect the project and documenting their characteristics.

3- Perform Qualitative Risk Analysis.

prioritizing risks for further analysis or action by assessing and combining their probability of occurrence and impact.

4- Perform Quantitative Risk Analysis.

numerically analyzing the effect of identified risks on overall project objectives.

5- Plan Risk Responses.

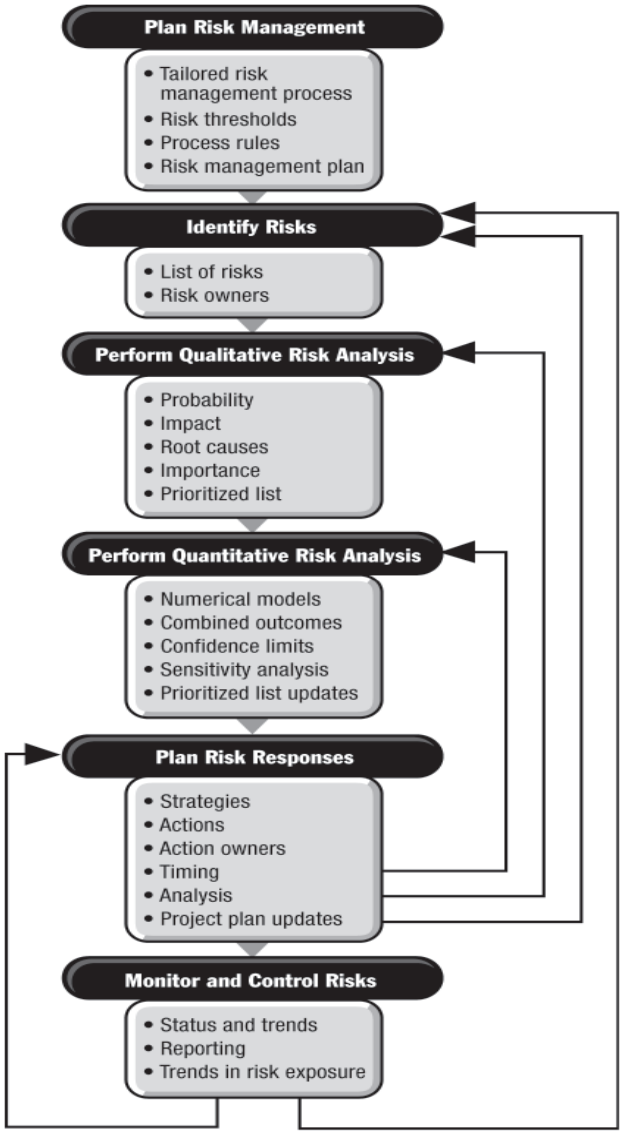
- **Determines appropriate response strategies and actions for each individual risk and for overall project risk, to enhance opportunities and reduce threats to project objectives and overall project risk.**
- **Integrates the actions into project plan.**

6- Monitor and Control Risks

- **Implements agreed-upon actions of the risk response plans.**
- **Reviews changes in project risk exposure.**
- **Identifies additional risk management actions as required.**
- **Assesses the effectiveness of the Project Risk Management process and risk responses.**
- **Tracking identified risks, monitoring residual risks and identifying new risks.**

Risk Owner VS Risk Action Owner

RISK OWNER	RISK ACTION OWNER(Response Owner)
A single risk owner should be assigned to every identified risk.	Each agreed-upon risk response should have a single risk action owner.
Manage the corresponding risk through all of the subsequent Project Risk Management processes.	Reports periodically to the project manager on the effectiveness of the plan, any unanticipated effects, and any correction needed to handle the risk appropriately.
Select a suitable strategy for each individual risk based on its characteristics and assessed priority.	Ensuring that the agreed-upon risk responses are carried out as planned, in a timely manner.
Ensuring that the strategy is achievable, affordable, cost effective, and appropriate.	Take agreed-upon actions as required.
Defining actions to implement the chosen strategy. These actions may be delegated to action owners as appropriate.	Provide the risk owners with relevant information on status or changes to the risk characteristics.
Monitor actions to determine their effectiveness, and also to identify any secondary risks which may arise because of the implementation of risk responses.	Monitor the trigger conditions and ensure that the corresponding actions are carried out as defined, in a timely manner.
Ensuring that the risk response is effective and for planning additional risk responses if required.	
Assess the effectiveness of any actions, decide whether additional actions are required, and keep the project manager informed of the situation.	
Risk owner may choose to assemble a team to develop a response.	


Plan Risk Management
• Tailored risk management process
• Risk thresholds
• Process rules
• Risk management plan
Identify Risks
• List of risks
• Risk owners
Perform Qualitative Risk Analysis
• Probability
• Impact
• Root causes
• Importance
• Prioritized list
Perform Quantitative Risk Analysis
• Numerical models
• Combined outcomes
• Confidence limits
• Sensitivity analysis
• Prioritized list updates
Plan Risk Responses
• Strategies
• Actions
• Action owners
• Timing
• Analysis
• Project plan updates
Monitor and Control Risks
• Status and trends
• Reporting
• Trends in risk exposure

Questions

1- You are a project manager of a new project .You and the risk manager are tailoring the project risk management activities, resources and attentions since different projects warrant different levels of risk management application. How can you tailoring the project risk management?

A- Tailoring the Project by OPA and EEF.
B- Define risk policies, tolerance and threshold.
C- Scale the project elements and Enterprise organizational factors.
D- Define how the elements of the Project Risk Management process will be scaled for this project, and define risk tolerances.

Questions

1- You are a project manager of a new project .You and the risk manager are tailoring the project risk management activities, resources and attentions since different projects warrant different levels of risk management application. How can you tailoring the project risk management?

A- Tailoring the Project by OPA and EEF.

B- Define risk policies, tolerance and threshold.

C- Scale the project elements and Enterprise organizational factors.

D- Define how the elements of the Project Risk Management process will be scaled for this project, and define risk tolerances.

Correct answer is D.

The main actions to provide the required tailoring are as follows:

1-Define those objectives against which risks will be identified,

2-Define how the elements of the Project Risk Management process will be scaled for this project, and

3-Define risk thresholds, tolerances, and the assessment framework.

Practice Standard page #14.

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LESSON 4

Plan Risk Management Process

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LESSON4. PLAN RISK MANAGEMENT PROCESS

Domain 1: Risk Strategy and Planning

Activities related to developing policies, processes, and procedures for risk assessment, planning, and response.

Tasks	Risk Strategy and Planning (19–20%)
Task 1	Develop risk assessment processes and tools that quantify stakeholder risk tolerances in order to assess and determine risk thresholds for the project and set criteria for risk levels.
Task 2	Update risk policies and procedures using information such as lessons learned from projects and outputs of risk audits in order to improve risk management effectiveness.
Task 3	Develop and recommend project risk strategy based on project objectives in order to establish the outline for the risk management plan.
Task 4	Produce risk management plan for the project on the basis of inputs such as project information, external factors, stakeholder inputs, and industry policies and procedures in order to define, fund, and staff effective risk management processes for the project that align with other project plans.
Task 5	Establish evaluation criteria for risk management processes based on project baselines and objectives in order to measure effectiveness of the project risk process.

LESSON4. PLAN RISK MANAGEMENT PROCESS

4.3 Inputs, Tools & Techniques, and Outputs

Question

You are a Project manager in your organization "Delta", during the planning meeting you and the risk manager developing process and tools to determine the stakeholders risk tolerance ,One of the core team asks why are you determining the tolerance?

A. To assess the attenuated and Cognitive bias.
B. To assess the threshold and set criteria for risk level.
C. To prioritize the risk.
D. To measure the risk management effectiveness.

Correct answer is B.
Domain 1 Task 1 :Develop risk assessment processes and tools that quantify stakeholder risk tolerances in order to assess and determine risk thresholds for the project and set criteria for risk levels.

LESSON4. PLAN RISK MANAGEMENT PROCESS

4.1 Purpose, Objectives and Concepts

- Develop the overall risk management strategy for the project.
  - To decide how the risk management processes will be executed.
  - To integrate Project Risk Management with all other project management activities.
- It describes the relationships among Project Risk Management, general project management, and the management processes in the organization.
- Provide sufficient resources and time for risk management activities and to establish an agreed upon basis to evaluate risks.
- **The key benefit :**

  Ensures that the degree, type, and visibility of risk management are commensurate with both the risks and the importance of the project to the organization.

LESSON4. PLAN RISK MANAGEMENT PROCESS

4.1 Purpose, Objectives and Concepts

- It is **vital to communicate** with and obtain agreement and support from all stakeholders to ensure the risk management process is supported and performed effectively over the project life cycle.
- **Effective** risk management requires creation of a risk management plan.
- **Careful and explicit** planning enhances the probability of success for other risk management processes.
- Begin when a project is conceived and completed early in project planning.
- The risk management plan may need to be updated as the needs of the project and its stakeholders.

LESSON4. PLAN RISK MANAGEMENT PROCESS

4.1 Purpose, Objectives and Concepts

- Project Risk Management processes form an integral part of the overall project management plan.
- Risk management activities should be integrated into the project management plan.
- The budget in terms of resources, cost, and time for the specific risk management activities should be established in order to better track, control and, as necessary, defend the corresponding expenditures throughout the project.
- The cost of treating the risks themselves should be included appropriately in the project budget, while the risk management plan should describe how this part of the project budget is evaluated, allocated, and managed.

LESSON4. PLAN RISK MANAGEMENT PROCESS

4.1 Purpose, Objectives and Concepts

- The risk management plan will define the monitoring methods to ensure that the corresponding expenditures are tracked appropriately, as well as the conditions under which the approved budget for risk management can be modified.
- Risk management activities need to be repeated throughout the project lifecycle.
- Risk management plan should define both the normal frequency for repeating the processes and specific or exceptional conditions.

There are two categories of success criteria for risk management:

a) Project-Related Criteria.

To **assess the success** of Project Risk Management, the stakeholders must **agree** on an **acceptable level of results** for the **project-related criteria** (such as cost, time, and scope).

b) Process-Related Criteria.

The **measures for success** in Project Risk Management depend on a number of **factors**, such as **the level of uncertainty of the project**

LESSON4. PLAN RISK MANAGEMENT PROCESS

4.3 Inputs, Tools & Techniques, and Outputs

Question

You are a Project manager in your organization "DAH". During the execution you are searching about a monitoring methods to ensure that the risk management expenditures are tracked appropriately. Which of the following is defining that method?

A. Project management plan.
B. Cost management plan.
C. Risk management plan.
D. Change management plan.

Correct answer is C:
The risk management plan will define the monitoring methods to ensure that the corresponding expenditures are tracked appropriately, as well as the conditions under which the approved budget for risk management can be modified.

Project Risk and attitudes

- The level of accepted risk in a project depends on the risk attitudes of the relevant stakeholders.

- Quantify stakeholder risk tolerances in order to assess and determine risk thresholds for the project and set criteria for risk levels.

- The risk attitudes of both the organization and the stakeholders may be influenced by a number of factors, all need to be identified.
  - Tolerance .
  - Relative importance to achieving or missing specific project objectives.
  - Appetite.
  - Threshold.
  - Stakeholders sensitivity to issue.

- Guidelines and rules for escalating risk-related information to management and other stakeholders should reflect the risk attitudes and expectations of the corresponding stakeholders.

- The project manager should maintain effective communication with the stakeholders as the project evolves, in order to become aware of any changes in the stakeholders' attitudes and update the risk management approach to take any new facts into account.

.

LESSON4. PLAN RISK MANAGEMENT PROCESS

4.1 Purpose, Objectives and Concepts

- It is important that the participants **share** a common understanding **of all terms used to describe the risks**, and that **the critical values and thresholds** that will serve as parameters for the tools should be defined in a manner consistent with the scope of the project and the attitudes of the stakeholders.

  - If qualitative analysis uses such terms "high impact" or "medium probability,". So should be defined objectively in the risk management plan.

  - the risk management plan should specify any key numerical values required in quantitative analysis or for decision-making in risk response planning or risk monitoring and control.

LESSON4. PLAN RISK MANAGEMENT PROCESS

4.1 Purpose, Objectives and Concepts

- To carry out the Project Risk Management processes correctly and effectively, the project team and other stakeholders need to know:-
  - ✓ Where and when they will be expected to participate,
  - ✓ Their criteria for determining success,
  - ✓ their level of authority, and
  - ✓ what action to take relative to actions or decisions beyond this level.

- The risk management plan specifies:-
  - ✓ The project's risk management roles and responsibilities.
  - ✓ Defines the corresponding expectations for both senior management and project personnel.

Risk-related communication. occurs at two levels:

- The principles of communication of the two levels are defined in the risk management plan.

(a) Within the project team. the plan describes the:-
frequency, scope, structure and content of the various risk management meetings and reports required to carry out the corresponding Project Risk Management processes.

(a) Between the project team and the other project stakeholders.
The plan sets their expectations as to the:

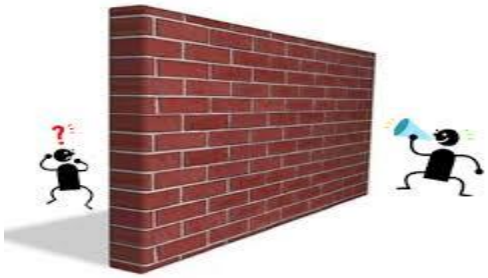
- ✓ Structure, content, and frequency of routine documents to be received.
- ✓ Way in which information will be shared for escalation or exceptional events.

- Details of the Information required by the project team from stakeholders should also be clearly defined in risk management plan.

LESSON4. PLAN RISK MANAGEMENT PROCESS

4.2 Critical Success Factors

1- Identify and Address Barriers to Successful Project Risk Management.



2- Involve Project Stakeholders in Project Risk Management.

3- Comply with the Organization's Objectives, Policies, and Practices.

LESSON4. PLAN RISK MANAGEMENT PROCESS

4.2 Critical Success Factors

1- Identify and Address Barriers to Successful Project Risk Management.

- Organization and the stakeholders don't recognize the value /benefits of risk management.
- No clear definition for project objectives.
- Unavailability of OPA which will consume more time to be developed.
- Risk Management Plan isn’t integrated in overall project plan.

2- Involve Project Stakeholders in Project Risk Management.

- To build on their skills and experience .
- To ensure their understanding of, and commitment to the full Project Risk Management process.
- Management should be involved in the analysis of the level of resourcing required for managing project risk and accept the risks that may arise from specific limitations.
- Address and resolve disagreements between stakeholders in the areas of risk tolerance and evaluation measures .

3- Comply with the Organization's Objectives, Policies, and Practices.

- The feasibility of risk management planning is dependent upon the features of the organization.
.
- The rules and guidelines defined in the risk management plan should be compatible with the culture of the organization, its capabilities from the point of view of people and facilities, and its values, goals, and objectives.

- Project management in general, and risk management in particular, contribute to the organization's effective governance.

- The risk management plan should identify and take into account the relevant organizational procedures and any other enterprise environmental factors such as strategic risk management or governance processes..

LESSON4. PLAN RISK MANAGEMENT PROCESS

4.3 Inputs, Tools & Techniques, and Outputs

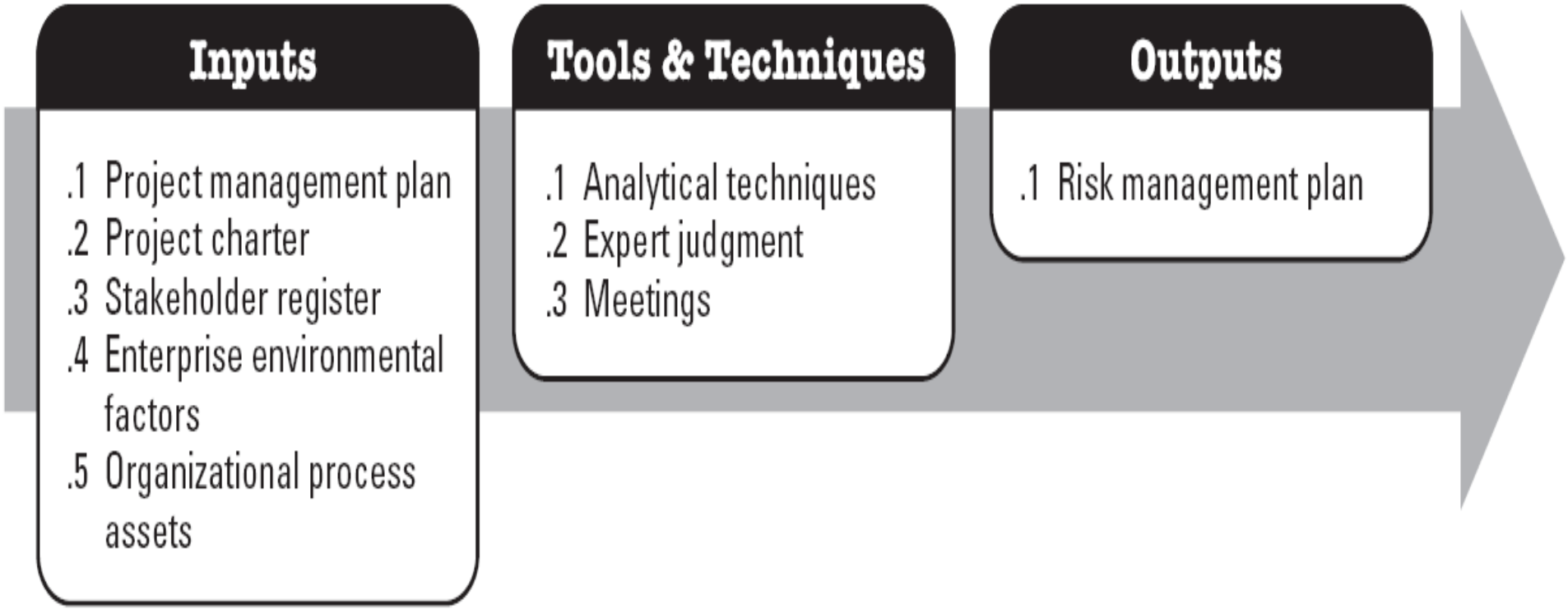
Question

In your organization you and your team are studying the CSF of one of the risk processes, which of the following is a CSF of Plan risk management process?
A-Project should be compatible with capabilities of people and facilities.
B- Use agreed upon approach.
C- Iterative identification.
D- Maintain risk awareness.

Answer is A.
Critical success factors of plan risk management in the risk practice standard Chapter 4 page 22. Comply with the Organization's Objectives, Policies, and Practices. The rules and guidelines defined in the risk management plan should be compatible with the culture of the organization, its capabilities from the point of view of people and facilities, and its values, goals, and objectives.

LESSON4. PLAN RISK MANAGEMENT PROCESS

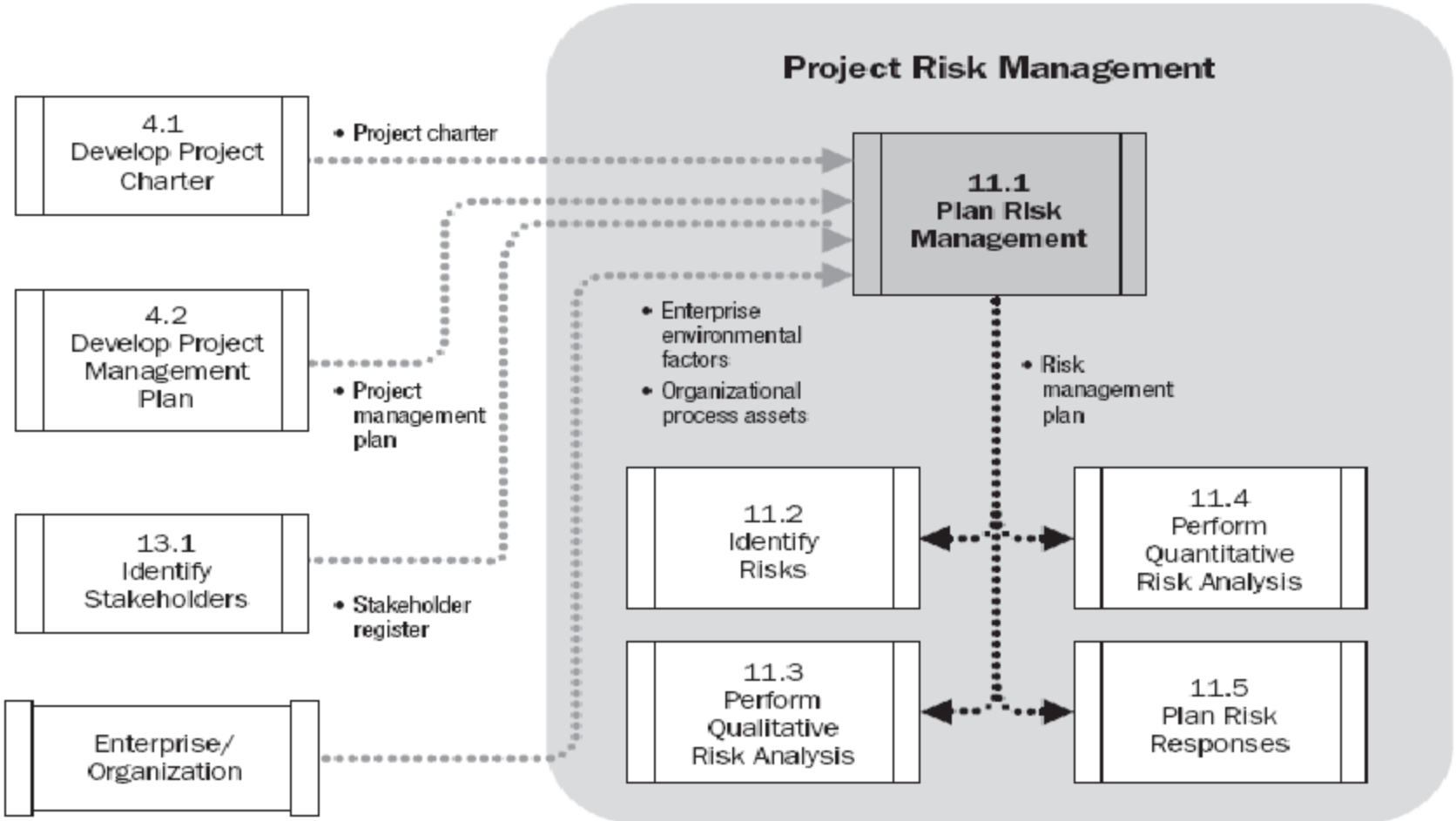
4.3 Inputs, Tools & Techniques, and Outputs



LESSON4. PLAN RISK MANAGEMENT PROCESS

4.3 Inputs, Tools & Techniques, and Outputs

Plan Risk Management Data Flow Diagram



LESSON4. PLAN RISK MANAGEMENT PROCESS

4.3 Inputs, Tools & Techniques, and Outputs

Inputs

1- Project Management Plan

- Includes all approved subsidiary management plans and baselines should be taken into consideration in order to make the risk management plan consistent with them.
- The risk management plan is also a component of the project management plan.
- The project management plan provides baseline or current state of risk-affected areas including scope, schedule, and cost.

Project Management Plan	
Change management plan	Quality management plan
Communications management plan	Requirements management plan
Configuration management plan	Risk management plan
Cost baseline	Schedule baseline
Cost management plan	Schedule management plan
H R management plan	Scope management plan
Process improvement plan	Stakeholder management plan
Scope baseline Project scope statement WBS WBS dictionary	Procurement management plan

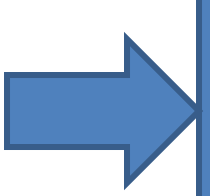
LESSON4. PLAN RISK MANAGEMENT PROCESS

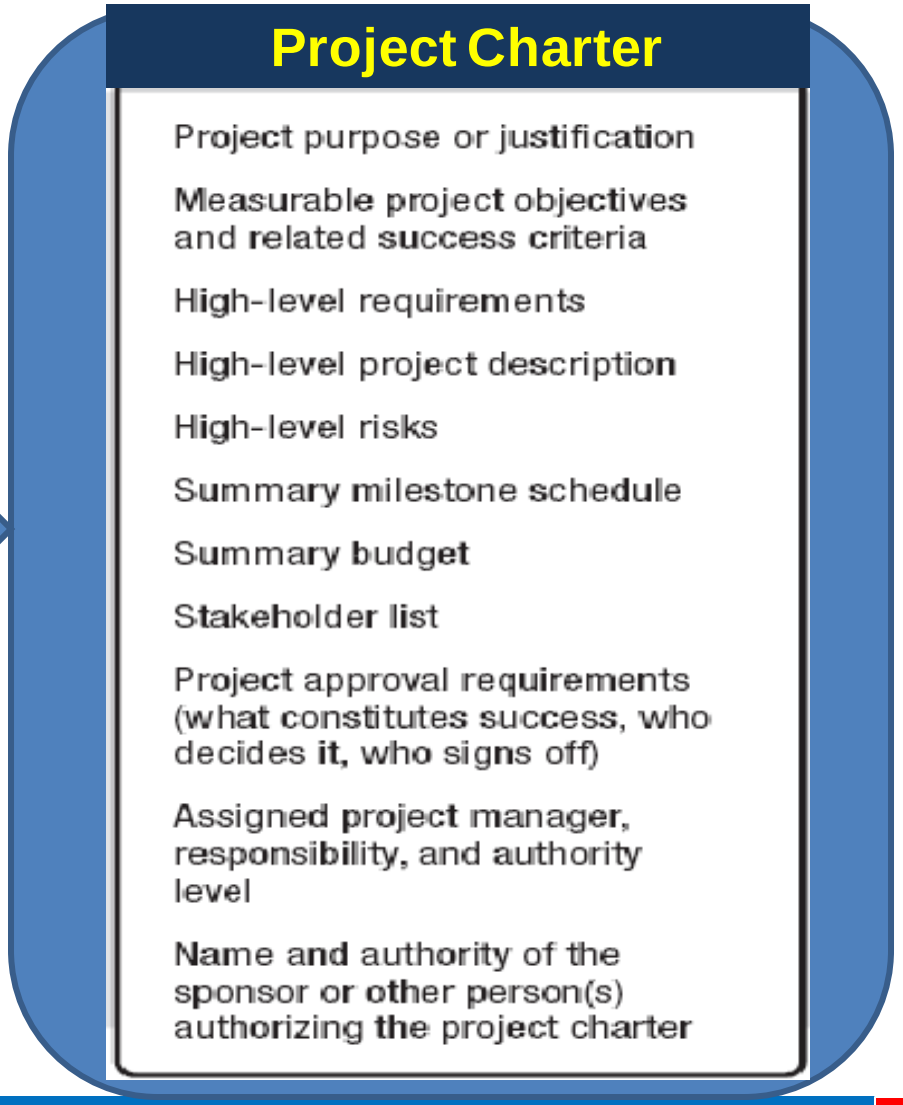
4.3 Inputs, Tools & Techniques, and Outputs

Inputs

2- Project Charter

Project Charter
The project charter can provide various inputs such as




Project Charter
Project purpose or justification
Measurable project objectives and related success criteria
High-level requirements
High-level project description
High-level risks
Summary milestone schedule
Summary budget
Stakeholder list
Project approval requirements (what constitutes success, who decides it, who signs off)
Assigned project manager, responsibility, and authority level
Name and authority of the sponsor or other person(s) authorizing the project charter

LESSON4. PLAN RISK MANAGEMENT PROCESS

4.3 Inputs, Tools & Techniques, and Outputs

Inputs

2- Project Charter

<Project Name> Project Charter				
(S.M.A.R.T.) Project Description				
Outcomes				
Project Need (Reasoning or Catalyst behind the project)				
Project Dates	Expected Start	Actual Start	Expected End	Project Budget
Stakeholders	Internal		Vendors	Partners
	Requirements Related to Both Project and Product Scope			
Scope	Describe the features & functions of the product / project		What will NOT be done in this project	
Milestones	List the milestones below		Baseline	Expected / Completed
Dependencies, Assumptions, & Risks	Dependencies		Assumptions	
	Time:		1.	
	Resource(s):		2.	
	Hardware/Software:		3.	
	Equipment:		Risks	
	Communication:		1.	
	Legal:		2.	
	Other:		3.	
Signatures	Project Sponsor		Project Manager	
	Printed Name:		Printed Name:	
	Signature	Date	Signature	Date

LESSON4. PLAN RISK MANAGEMENT PROCESS

4.3 Inputs, Tools & Techniques, and Outputs

Inputs

3- Stakeholder Register

Identification information	**Name, organizational position, location, role in the project, contact information**
Assessment information	**Major requirements, main expectations, potential influence in the project, phase in the life cycle.**
Stakeholder classification.	**Internal/external, supporter/neutral/ resistor, etc.**

The stakeholder register should be consulted and updated on a regular basis, as stakeholders may change, or new ones identified throughout the life cycle of the project.

LESSON4. PLAN RISK MANAGEMENT PROCESS

4.3 Inputs, Tools & Techniques, and Outputs

Inputs

3- Stakeholder Register

Stakeholder Register
stakeholder register, which contains all details related to the project's stakeholders

STAKEHOLDER REGISTER

Project Title: _____ Date Prepared: _____

Name	Position	Role	Contact Information	Requirements	Expectations	Influence	Classification

LESSON4. PLAN RISK MANAGEMENT PROCESS

4.3 Inputs, Tools & Techniques, and Outputs

Inputs

4- Enterprise Environmental Factors EEF

1- Organizational culture, structure, and governance.

2- Geographic distribution of facilities and resources.

3- Government or industry standards (e.g., regulatory agency regulations, codes of conduct, product standards, quality standards, and workmanship standards).

4- Infrastructure (e.g., existing facilities and capital equipment).

5- Existing human resources (e.g., skills, disciplines, and knowledge, such as design, development, legal, contracting, and purchasing).

6- Personnel administration (e.g., staffing and retention guidelines, employee performance reviews and training records, reward and overtime policy, and time tracking).

7- Company work authorization systems

LESSON4. PLAN RISK MANAGEMENT PROCESS

4.3 Inputs, Tools & Techniques, and Outputs

Inputs

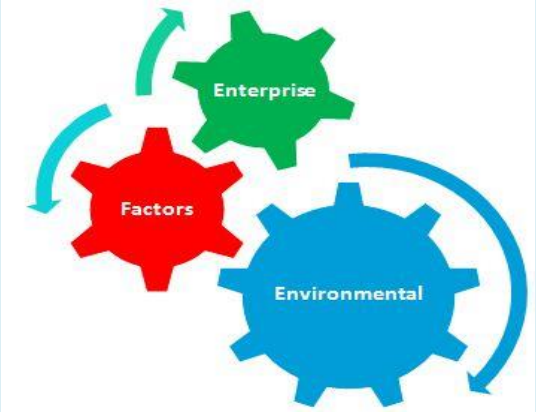
4- Enterprise Environmental Factors .. Cont.

8- Marketplace conditions.

9- Stakeholder risk tolerances, threshold and attitude.

10- Political climate.

11- Organization's established communications channels.



12- Commercial databases (e.g., standardized cost estimating data, industry risk study information, and risk databases).

13- Project management information system (e.g., an automated tool, such as a scheduling software tool, a configuration management system, an information collection and distribution system, or web interfaces to other online automated systems).

14- Benchmarking.

LESSON4. PLAN RISK MANAGEMENT PROCESS

4.3 Inputs, Tools & Techniques, and Outputs

Inputs

5- Organizational Process Assets OPA

1- Risk control procedures including risk categories, probability definition and impact, and probability and impact matrix.

2- Standard Templates (e.g., risk register, Risk breakdown structure, probability definition and impact, and probability and impact matrix).

3- Specific organizational standards such as policies (e.g., human resources policies, health and safety policies, ethics policies, and project management policies),

4- Guidelines and criteria for tailoring the organization's set of standard processes and procedures to satisfy the specific needs of the project.

5- Change control procedures.

6- Historical information and lessons learned knowledge bases (e.g., project records and documents, and information from risk management activities,.).

LESSON4. PLAN RISK MANAGEMENT PROCESS

4.3 Inputs, Tools & Techniques, and Outputs

Inputs

5- Organizational Process Assets..Cont.

7 - Risk categories.

8- Common definitions of concepts and terms.

11- Risk statement formats, or templates.

12- Roles and responsibilities.

13- Authority levels for decision making.

14- Lessons learned.

15- Project files, including actual data from previous projects (risk registers, planned response actions, and defined risk impact, ..).

16- Risk-rating rules.

Question

Who is not an expert judgment?

A- Project sponsor.
B- Project customers.
C- Project manager.
D- Consultant.

Correct answer is C:
Project team members and the project manager are not Expert Judgment for their project.

Question

You are a project manager in your organization. During the planning meeting you and the participants want to determine the Stakeholders risk attitude and tolerance. Where can you find the stakeholders risk attitude and tolerance?

A. Enterprise Environmental Factors.
B. Risk management plan.
C. Project management plan.
D. Organizational process Assets.

Correct answer is A.
The enterprise environmental factors that can influence the Plan Risk Management process include, but are not limited to, risk attitudes, thresholds, and tolerances. PMBOK page #314.
During plan risk management process the tolerance can be found in the enterprise environmental factors but after plan risk will be in the risk management plan
.

LESSON4. PLAN RISK MANAGEMENT PROCESS

4.3 Inputs, Tools & Techniques, and Outputs

Question

You are a project manager in your organization. During the planning meeting you and the participants want to use templates for Risk management plan, Risk Register, probability and impact definition and probability and impact matrix. Where can you find the above templates?

A. Enterprise Environmental Factors.
B. Risk management plan.
C. Project management plan.
D. Organizational process Assets.

Correct answer is D.
During the planning meeting general organizational templates for risk categories and definitions of terms such as levels of risk, probability by type of risk, impact by type of objectives, and the probability and impact matrix will be tailored to the specific project. If templates for other steps in the process do not exist, they may be generated in these meetings. PMBOK page #316.

LESSON4. PLAN RISK MANAGEMENT PROCESS

4.3 Inputs, Tools & Techniques, and Outputs

Tools and Techniques

1- Analytical Techniques

Analytical techniques are used to **understand and define**

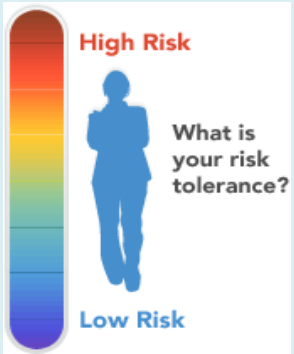
Overall risk management context. is a combination of

Stakeholder Risk Attitudes

Strategic Risk exposure

stakeholder risk profile analysis

Grade and qualify appetite and tolerance



Strategic Risk Scoring Sheets

High-level assessment of the risk exposure

Risk factors	Left arm Colour	Left arm Score	Right arm Colour	Right arm Score
A1 Arm movements		6		6
A2 Repetition		4		4
B Force		0		0
C1 Head/neck posture		0		0
C2 Back posture		1		1
C3 Arm posture		2		2
C4 Wrist posture		1		1
C5 Hand/finger grip		2		2
D1 Breaks		4		4
D2 Work pace		0		0
D3 Other factors		0		0
Task score		20		20
D4 Duration multiplier		X 0.75		X 0.75
Exposure score		15		15
D5 Psychosocial factors				

Then the project team can allocate appropriate resources and focus on the risk management activities.

LESSON4. PLAN RISK MANAGEMENT PROCESS

4.3 Inputs, Tools & Techniques, and Outputs

Tools and Techniques | **2- Expert Judgment**

To ensure a comprehensive establishment of the risk management plan, judgment, and expertise should be considered from groups or individuals with specialized training or knowledge on the risk management.

- ❑ Senior management.
- ❑ Project stakeholders including customers or sponsors, suppliers.
- ❑ Project managers who have worked on projects in the same area (directly or through lessons learned).
- ❑ Subject matter experts (SMEs) in business or project area.
- ❑ Industry groups and consultants.
- ❑ Professional and technical associations.
- ❑ Other units within the organization.
- ❑ Project management office (PMO).

Project team members and the project manager are not Expert Judgment for their project.

LESSON4. PLAN RISK MANAGEMENT PROCESS

4.3 Inputs, Tools & Techniques, and Outputs

Tools and Techniques ⇨ **3- Meetings (Planning Meeting and analysis)**

Project teams hold planning meetings to develop the risk management plan.

Attendees

- ❑ Project manager.
- ❑ Selected project team members.
- ❑ Selected stakeholders.
- ❑ Anyone in the organization with responsibility to manage the risk planning and execution activities.
- ❑ SME, Facilitator and Others, as needed.

Risk management
cost elements and schedule activities should be developed for inclusion in the project budget and schedule,

Tools and Techniques ⇨ 3- Meetings (Planning Meeting and analysis).Cont

- High-level plan for conducting the risk management activities are defined in these meetings.
- Risk contingency reserve application approaches may be established or reviewed.
- Risk management responsibilities should be assigned.
- Templates for risk and definitions will be tailored to the specific project :-
  - Levels of risk.
  - probability by type of risk.
  - Impact by type of objectives.
  - Probability and impact matrix.
  - RBS.

If templates for other steps in the process do not exist, they may be generated in these meetings.
The outputs of these activities are summarized in the risk management plan.

LESSON4. PLAN RISK MANAGEMENT PROCESS

4.3 Inputs, Tools & Techniques, and Outputs

Tools and Techniques ⇨ **3- Meetings (Planning Meeting and analysis).Cont**

Strengths, Weaknesses and CSF of planning Meeting

Technique	Strengths	Weaknesses	CSFs for Effective Application
Planning Meetings and Analysis	• Involvement of core team members	• Depends on experience of participants	• Prior risk management plan templates • Prior stakeholder analysis • Existing organizational guidelines for risk management

LESSON4. PLAN RISK MANAGEMENT PROCESS

4.3 Inputs, Tools & Techniques, and Outputs

Tools and Techniques ⇨ **Planning Session**

Attendees

- ❑ Project manager.
- ❑ Selected project team members.
- ❑ Selected stakeholders.
- ❑ Anyone in the organization with responsibility to manage the risk planning and execution activities.
- ❑ SME, Facilitator and Others, as needed.

❑ The initial **Risk responsibilities, methodology, templates, terms, definitions, time schedules, and cost budgets for the other r**isk management processes should be assigned and accepted.

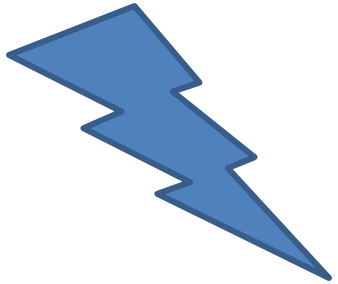
❑ **The specification should include** (all parameters and other inputs required)for the **tools** will be used in subsequent risk processes should be documented in the risk management plan, when formally approved.

LESSON4. PLAN RISK MANAGEMENT PROCESS

4.3 Inputs, Tools & Techniques, and Outputs

Tools and Techniques ⇨ **Planning Session**

Planning sessions are recommended in order to **build a common understanding** of the project's risk approach **between project stakeholders** and **to gain agreement** on the techniques to be used for managing risk.



Question

Which one of the following tools will be used to define the stakeholders risk attitude and tolerance?

A- Planning meeting.
B- Stakeholders risk Profile analysis technique.
C- AHP.
D-Monte Carlo Simulation.

Correct answer is B:
Stakeholder risk profile analysis is used to **grade and qualify appetite and tolerance**

LESSON4. PLAN RISK MANAGEMENT PROCESS

4.3 Inputs, Tools & Techniques, and Outputs

Output ⇨ **Risk Management Plan ..Contd.**

The risk management plan is a component of the project management plan.

- Describes **how** risk management **activities** will be structured and **performed**.
- Describe what has been **agreed upon.**
- Describe the **stakeholders' roles and responsibilities** in the activities.

People	Tools	Business
Attitudes	Toolbox	Constraints
Roles, responsibilities, authority	Parameters	Amount of detail and effort
Communications	Definitions	

Key Areas of Focus for the Plan Risk Management Process

LESSON4. PLAN RISK MANAGEMENT PROCESS

4.3 Inputs, Tools & Techniques, and Outputs

Output ⇨ **Risk Management Plan ..Contd.**

Depending upon the size and complexity of the project, some or all of the following elements will be present in a risk management plan.

- Introduction;
- Project description;
- Risk management methodology;
- Risk management organization;
- Roles, responsibilities, and authority;
- Stakeholder risk tolerance;
- Criteria for success;
- Risk management tools and guidelines for use;
- Thresholds and corresponding definitions;
- Templates;
- Communications plan;
- Strategy; and
- Risk breakdown structure.

LESSON4. PLAN RISK MANAGEMENT PROCESS

4.3 Inputs, Tools & Techniques, and Outputs

Output ⇨ **Risk Management Plan ..Contd.**

Risk Management Plan includes	
1- Methodology	❑ Defines the approaches, tools, and data sources that will be used to perform risk management on the project. ❑ Relationship with the organizational environment ❑ Risk management activities ■ Link to the project management methodology ■ Relationship with other project management processes ❑ Risk taxonomy/risk breakdown structure (generic or project-specific) ❑ Format of a defined risk statement description (“metalanguage”) ❑ Key deliverables
2- Roles and responsibilities.	Defines the lead, support, and risk management team members for each type of activity in the risk management plan, and clarifies their responsibilities.

LESSON4. PLAN RISK MANAGEMENT PROCESS

4.3 Inputs, Tools & Techniques, and Outputs

Output ⇨ **Risk Management Plan ..Contd.**

Risk Management Plan includes	
3- Budgeting	Estimates funds needed, based on assigned resources, for inclusion in the cost baseline and establishes protocols for application of contingency and management reserves.
4- Timing.	Defines when and how often the risk management processes will be performed throughout the project life cycle, establishes protocols for application of schedule contingency reserves, and establishes risk management activities for inclusion in the project schedule.

LESSON4. PLAN RISK MANAGEMENT PROCESS

4.3 Inputs, Tools & Techniques, and Outputs

Output ⇨ **Risk Management Plan ..Contd.** ⇨ **5- Risk categories**

Provide a means of grouping potential causes of risk.

As **Risk Breakdown Structure (RBS)**

RBS

Hierarchical representation of risks by risk categories.

OR

Hierarchical framework of potential sources of risk.

- ❑ Generic RBS
- ❑ Project-specific RBS

RBS LEVEL 0	RBS LEVEL 1	RBS LEVEL 2
ALL SOURCES OF PROJECT RISK	1. TECHNICAL RISK	1.1 Scope definition
		1.2 Requirements definition
		1.3 Estimates, assumptions, and constraints
		1.4 Technical processes
		1.5 Technology
		1.6 Technical interfaces
		Etc.
	2. MANAGEMENT RISK	2.1 Project management
		2.2 Program/portfolio management
		2.3 Operations management
		2.4 Organization
		2.5 Resourcing
		2.6 Communication
		Etc.
	3. COMMERCIAL RISK	3.1 Contractual terms and conditions
		3.2 Internal procurement
		3.3 Suppliers and vendors
		3.4 Subcontracts
		3.5 Client/customer stability
		3.6 Partnerships and joint ventures
		Etc.
	4. EXTERNAL RISK	4.1 Legislation
		4.2 Exchange rates
		4.3 Site/facilities
		4.4 Environmental/weather
		4.5 Competition
		4.6 Regulatory
		Etc.

LESSON4. PLAN RISK MANAGEMENT PROCESS

4.3 Inputs, Tools & Techniques, and Outputs

Output ⇨ **Risk Management Plan** ⇨ **6- Definitions of risk probability& impact**

Definitions of probability levels and impact levels are tailored to the individual project during the Plan Risk Management process for use in subsequent processes.

SCALE	PROBABILITY	± IMPACT ON PROJECT OBJECTIVES		
		TIME	COST	QUALITY
VHI	61-99%	>40 days	>$200K	Very significant impact on overall functionality
HI	41-60%	21-40 days	$101K-$200K	Significant impact on overall functionality
MED	21-40%	11-20 days	$51K-$100K	Some impact in key functional areas
LO	11-20%	6-10 days	$11K-$50K	Minor impact on overall functionality
VLO	1-10%	1-5 day	$1K-$10K	Minor impact on secondary functions
NIL	<1%	No change	No change	No change in functionality

LESSON4. PLAN RISK MANAGEMENT PROCESS

4.3 Inputs, Tools & Techniques, and Outputs

Output ⇨ **Risk Management Plan** ⇨ **7- Probability and Impact Matrix**

The combinations of probability and impact that lead to a risk being rated as **high, moderate**, or **low importance** **(Priority)** are usually set by the organization and can be tailored during plan risk management.

Matrix Probability vs. Impact

Probability						
Very High	0.5	0.05	0.10	0.15	0.20	0.25
High	0.4	0.04	0.08	0.12	0.16	0.20
Medium	0.3	0.03	0.06	0.09	0.12	0.15
Low	0.2	0.02	0.04	0.06	0.08	0.10
Very Low	0.1	0.01	0.02	0.03	0.04	0.05
		10%	0.2	0.3	0.4	0.5
		Very Low	Low	Medium	High	Very High
		Impact				

LESSON4. PLAN RISK MANAGEMENT PROCESS

4.3 Inputs, Tools & Techniques, and Outputs

Output ⇨ **Risk Management Plan ..Contd.**

Risk Management Plan includes	
8- Revised stakeholders' tolerances	Stakeholders Risk **Tolerances may be revised** in the Plan Risk Management process.
9- Reporting formats	❑ Define how the **outcomes** of The risk management process will be **documented, analyzed, and communicated.** ❑ Describes the **content and format of the risk register** and any other risk reports required.
10- Tracking	Documents **how risk activities will be recorded** for the benefit of the current project and how risk management processes **will be audited**.

LESSON4. PLAN RISK MANAGEMENT PROCESS

4.3 Inputs, Tools & Techniques, and Outputs

Output ⇨ **Risk Management Plan ..Contd.** ⇨ **11-Templates**

- Formal risk statement structure
- Means of categorizing risks: Risk breakdown structure
- Status report template
- Meeting agenda template
- Definitions for threat impacts
- Probability and impact matrix template
- Definitions for opportunity impacts
- Definitions for probabilities
- Risk prioritization and selection guidelines
- Definitions, by project objective, of probability and impact scales

LESSON4. PLAN RISK MANAGEMENT PROCESS

4.3 Inputs, Tools & Techniques, and Outputs

Output ⇨ **Risk Management Plan ..Contd.** ⇨ **11-Templates**

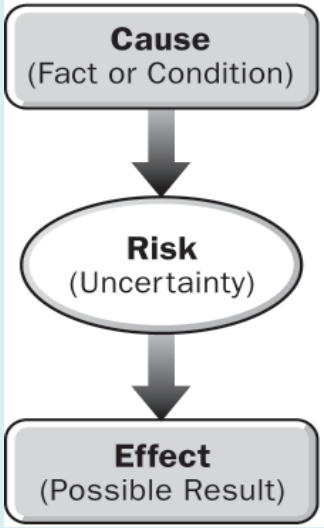
Formal risk statement structure = Meta-Language = three-part statements

Risks to be clearly defined, a standard structure for the way in which the risk is described. A typical such statement is:

Cause -- Risk -- Effect = Meta-Language = three-part statements

"Because of <one or more causes>, <risk> might occur, which would lead to <one or more effects>".

"As a result of cause, risk may occur, which would lead to effect."



LESSON4. PLAN RISK MANAGEMENT PROCESS

4.3 Inputs, Tools & Techniques, and Outputs

Output ⇨ **Risk Management Plan ..Contd.** ⇨ **11-Templates**

Risk Prioritization and Selection Guidelines

- The **selection and prioritization** of risks must be **linked to the project objectives.**

- The risk management plan will define the **relative importance to be assigned to these objectives** (e.g. reliability takes precedence over time, etc.):

  this may be in the form of numerical "weights" that can be applied to create a single weighted sum over all objectives for each risk.

- Any other features that may affect the **urgency** of dealing with a risk should also be specified (e.g. one linked to a resource that will soon disappear should be given **greater urgency**).

LESSON4. PLAN RISK MANAGEMENT PROCESS

4.3 Inputs, Tools & Techniques, and Outputs

Output ⇨ **Risk Management Plan ..Contd.**

Risk Management Plan includes	
12- Project Description	○ Project objectives ○ External dependencies ○ Stakeholder analysis
13- Risk Management Scope and Objectives	○ Variance thresholds ○ Prioritization of project objectives ○ Thresholds, weights and other parameters ■ Definition of criteria for "unacceptable threats" and "un-missable opportunities" ■ Impact scales, probability scales, PxI matrices, weighting of project objectives, prioritization and selection criteria, degree of confidence required for overall risk (e.g., 80 %) from quantitative risk analysis
14- Communications Planning	○ Documents, usage, rules for distribution (frequency, audience, etc.) ○ Document templates ▪ Risk register ▪ Risk status reports

LESSON4. PLAN RISK MANAGEMENT PROCESS

4.3 Inputs, Tools & Techniques, and Outputs

Output ⇨ **Risk Management Plan ..Contd.**

Risk Management Plan includes	
15- Risk Management Organization	○ Roles, responsibilities and levels of authority for risk management ■ Rules of escalation ○ Budgeting for risk management activities added to the project budget ■ Adapted to the complexity and sensitivity of the project ○ Scheduling of risk management activities in the project schedule, i.e. when certain actions or reviews need to be carried out.
16- Reporting	Governance-related rules of reporting and disclosure
17- Use of Tools	○ Tool name, description, usage ○ Structure of the risk database ■ Requirements in terms of system resources

LESSON4. PLAN RISK MANAGEMENT PROCESS

4.3 Inputs, Tools & Techniques, and Outputs

Question

Sami is a risk manager of a new hospital project for his organization MED Inc. He and his team using a tool/technique involves all core team members, needs templates, and Prior stakeholder analysis.
What is that tool/technique?

A. Variance analysis.
B. Trend analysis.
C. Brainstorming.
D. Planning meetings and analysis.

Correct answer is D.
Involvement of core team members is a strength of Planning Meetings and Analysis.“Prior risk management plan templates and Prior stakeholder analysis are critical success factors of Planning Meetings and Analysis. Reference Practice Standard for Project Risk Management page#69.

LESSON4. PLAN RISK MANAGEMENT PROCESS

4.3 Inputs, Tools & Techniques, and Outputs

Question

Michael is a project manager of a new see port project for his organization SEEP Inc. He and his team are in the perform quantitative risk process, they want to know the risk management scope and objectives, variance thresholds, prioritization of project objectives, thresholds, weights and other parameters. Which of the following would contain the above points?

A. Risk register.
B. Stakeholder register.
C. Risk management plan.
D. Impact and probability matrix.

Correct answer is C.
Risk management plan contains risk management scope and objectives, variance thresholds, prioritization of project objectives, thresholds, weights and other parameters, etc. Reference Practice Standard for Project Risk Management page#70.

Question

Which of the following would be contained within the risk management plan?

A. Change log.
B. WBS.
C. Stakeholders engagement assessment matrix.
D. Rules of escalation and key deliverables

Correct answer is D.
Risk management plan contains rules of escalation and key deliverables.
Reference: Practice Standard for Project Risk Management page#70.

RMP COACH

PROJECT RISK MANAGEMENT Course

PMI-RMP

LESSON 5
Identify Risks Process

Engr. ALAA SULTAN
Senior Project Manager
PgMP, PMP, PMI-RMP, OCP, 6SIGMA

LESSON5. IDENTIFY RISKS PROCESS

INTRODUCTION

Definition

Process of determining which risks may affect the project and documenting their characteristics.

The key benefit

Documentation of existing risks and the knowledge and ability it provides to the project team to anticipate events.

Participants in risk identification activities

- project manager.
- project team members.
- risk management team (if assigned).
- Customers.
- Subject matter experts from outside the project team.
- End users.
- Other project managers.
- Stakeholders.
- Risk management experts.
- All project personnel should be encouraged to identify potential risks.

LESSON5. IDENTIFY RISKS PROCESS

INTRODUCTION

Project team should be involved in the process to develop and maintain a sense of ownership and responsibility for the risks and associated risk response actions.

Stakeholders outside the project team may provide additional objective information.

Identify Risks Purpose

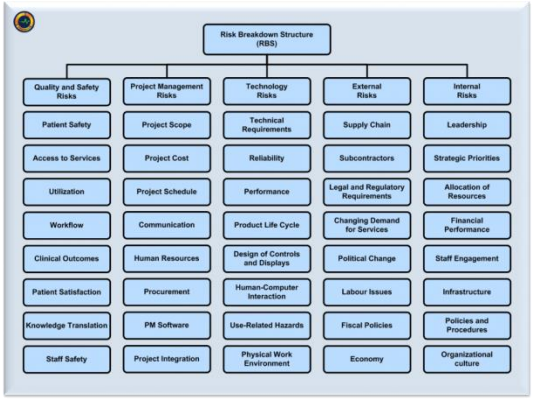
ITRATIVE PROCESS	• To identify all the knowable risks to project objectives. • Some risks are unknowable or emergent requires iterative.
IDENTIFY RISKS	Identify risks to the maximum extent that is practicable
IDENTIFY POTENTIAL RESPONSES	Identify potential responses at the time when a risk is first identified.
CONSIDER THE POTENTIAL RESPONSE	• For immediate action if such action is appropriate. • If not implemented immediately, should be considered during the Plan Risk Responses process.

LESSON5. IDENTIFY RISKS PROCESS

5.1 Purpose and Objectives of the Identify Risks Process

Identify Risks Objectives

1. Identify risks
2. Document risks
3. Categorize (risks and non risks)



LESSON5. IDENTIFY RISKS PROCESS

5.2 Critical Success Factors

Critical Success Factors

1- EARLY IDENTIFICATION

2- ITERATIVE IDENTIFICATION

3- EMERGENT IDENTIFICATION

4- COMPREHENSIVE IDENTIFICATION

5- EXPLICIT IDENTIFICATION OF OPPORTUNITIES

6- MULTIPLE PERSPECTIVES

7- RISKS LINKED TO PROJECT OBJECTIVES

8- COMPLETE RISK STATEMENT

9- OWNERSHIP AND LEVEL OF DETAILS

10- OBJECTIVITY

LESSON5. IDENTIFY RISKS PROCESS

5.2 Critical Success Factors

1- EARLY IDENTIFICATION

- Identifies risk as early as possible in the project lifecycle.
- Enables key project decisions to take maximum account of risks in the project, and may result in changes to the project strategy.
- Gives time to develop & implement of risk responses
- Enhance the efficiency. Since the responses taken early are normally less costly than the ones taken later.

LESSON5. IDENTIFY RISKS PROCESS

5.2 Critical Success Factors

2- ITERATIVE IDENTIFICATION

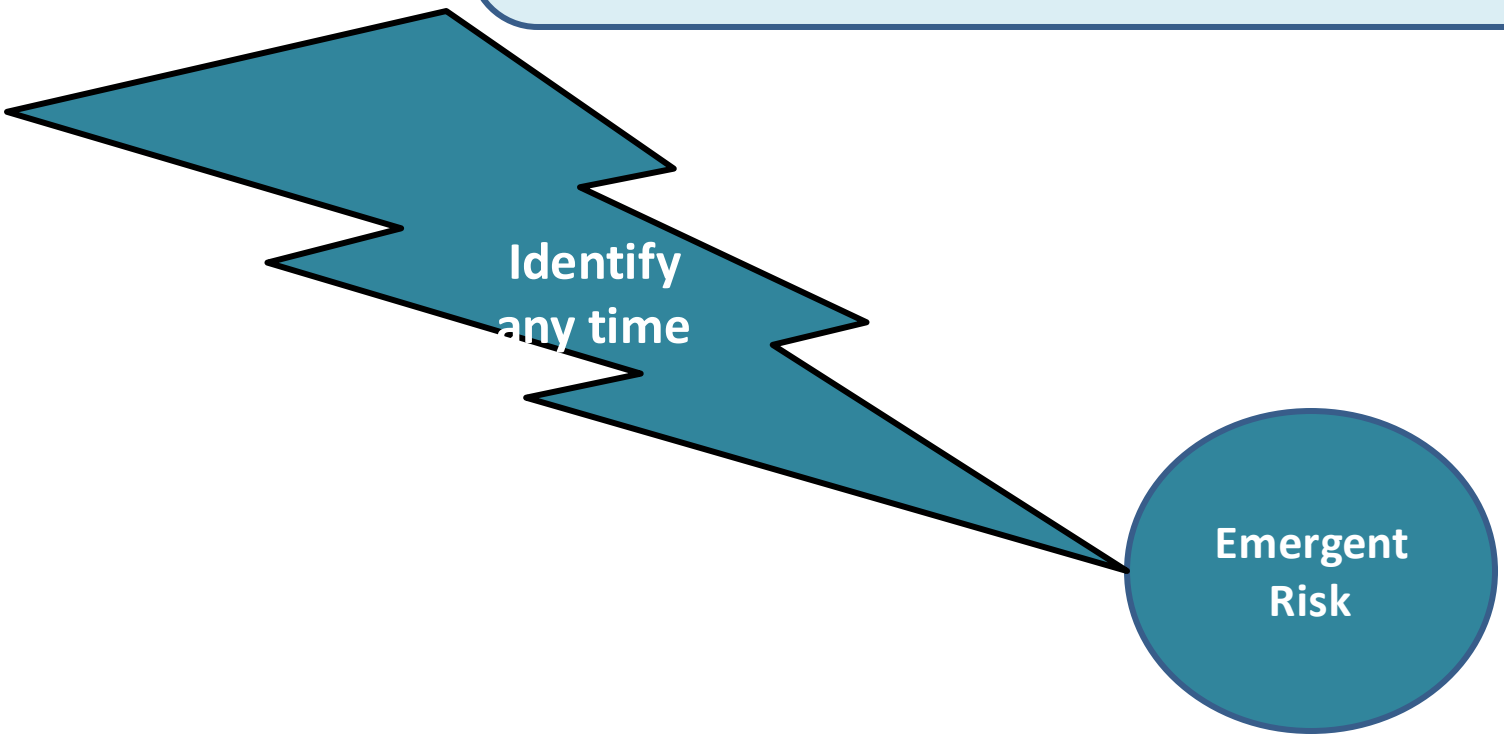
- Not all risks can be identified at any given point.
- Repeated throughout the project life cycle.
- Frequency determined during the Plan Risk Management.
- Might be repeated at key milestones and at significant change to the project or its operating environment.

LESSON5. IDENTIFY RISKS PROCESS

5.2 Critical Success Factors

3- EMERGENT IDENTIFICATION

Project Risk Management process should permit risks to be identified at any time, not limited to formal risk identification events or regular reviews.

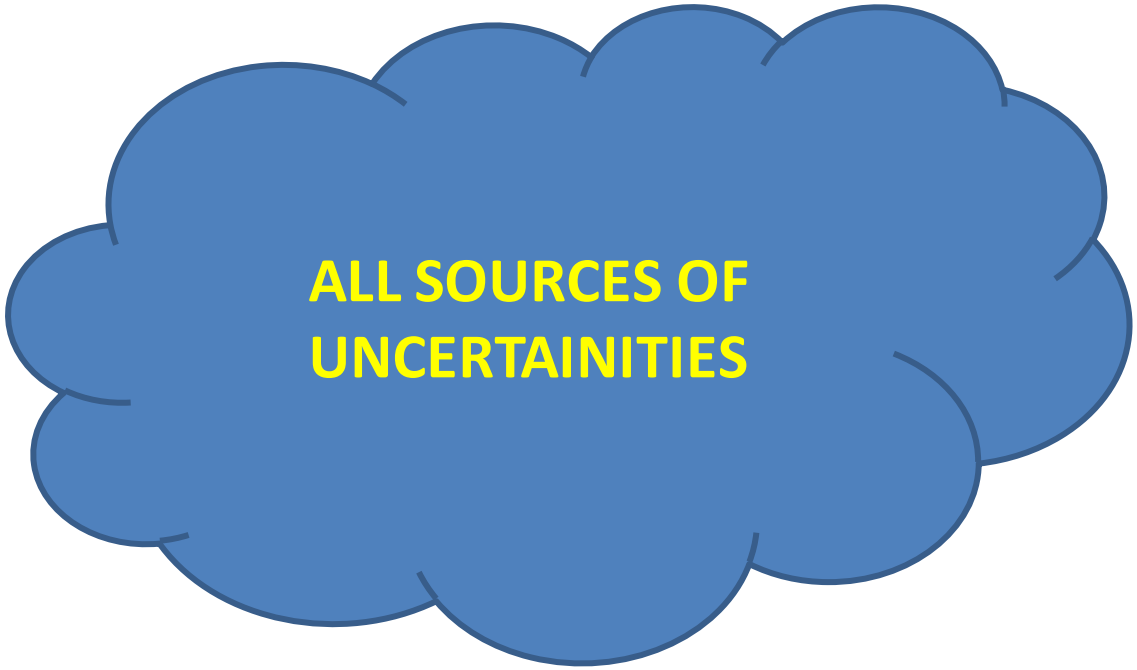


LESSON5. IDENTIFY RISKS PROCESS

5.2 Critical Success Factors

4- COMPREHENSIVE IDENTIFICATION

All sources of risk should be considered to ensure that all **uncertainties** have been **identified.**



LESSON5. IDENTIFY RISKS PROCESS

5.2 Critical Success Factors

5- Explicit Identification of Opportunities

The Identify Risk should ensure opportunities are properly considered.

LESSON5. IDENTIFY RISKS PROCESS

5.2 Critical Success Factors

6- MULTIPLE PERSPECTIVES

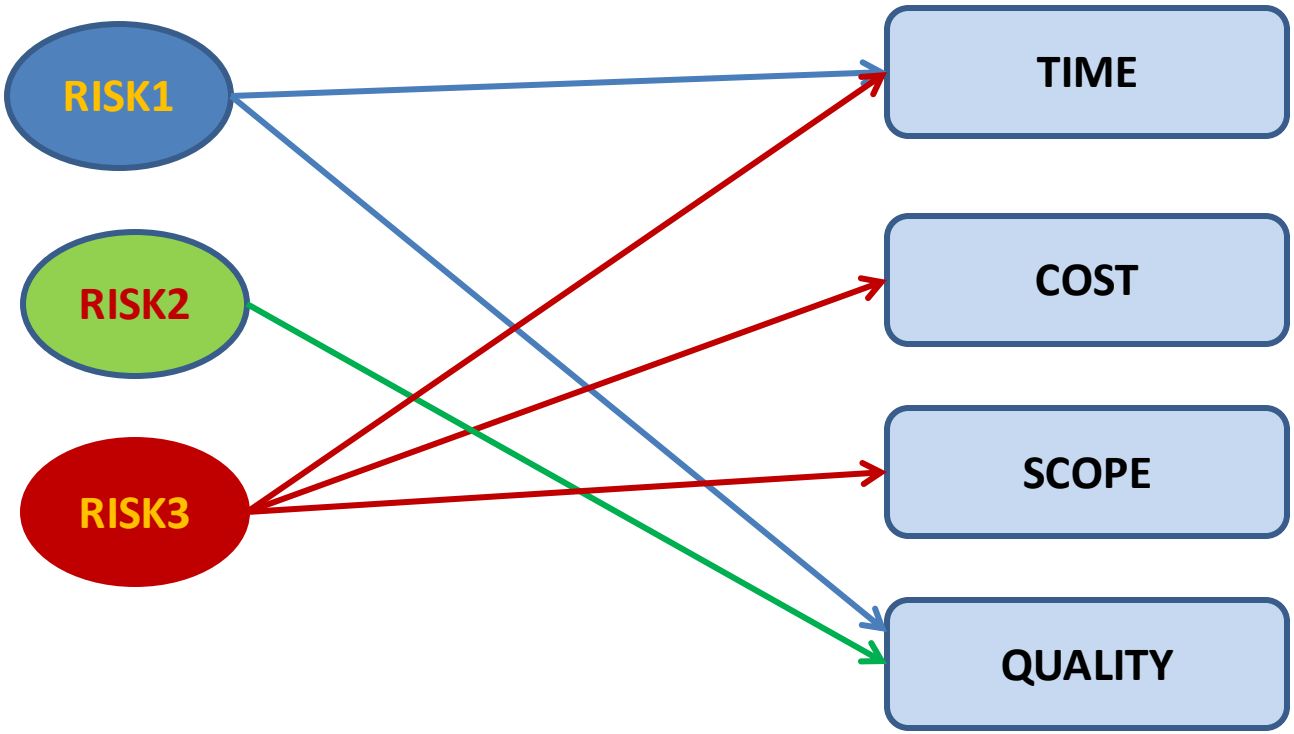
- Take input from a broad range of project stakeholders to ensure that **all perspectives are represented and considered**.
- Limiting risk identification to project team can not identify all knowable risks.

LESSON5. IDENTIFY RISKS PROCESS

5.2 Critical Success Factors

7- RISKS LINKED TO PROJECT OBJECTIVES

- Each identified project risk should relate to at least one project objectives (time, cost, quality, scope, etc.),
- Some risks may affect more than one objective.



LESSON5. IDENTIFY RISKS PROCESS

5.2 Critical Success Factors

8- COMPLETE RISK STATEMENT

- Risks should be clear and unambiguous to be understood by responsible for risk assessment and risk response planning.
- Detailed descriptions are required.
- Explicitly state the uncertainty and its causes and effects..

LESSON5. IDENTIFY RISKS PROCESS

5.2 Critical Success Factors

9-OWNERSHIP AND LEVEL OF DETAIL

- Risks identified at a **number of levels of detail.**
- **High-level** description make it **difficult** to develop responses and assign ownership.
- **Lot of detail create a great deal of work.**
- Each risk should be described **at a level of detail at** which it **can be assigned to a single risk owner with clear responsibility** and **accountability** for its management.
- **Trigger conditions** should also be identified where this is possible and appropriate.

LESSON5. IDENTIFY RISKS PROCESS

5.2 Critical Success Factors

10 - OBJECTIVITY

All human activities affected by **bias** especially when dealing with uncertainty.

Motivational biases
where someone is trying to bias the result in one direction or another.

Cognitive biases
occur where people are using their best judgment and applying heuristics

- Bias should be explicitly recognized and addressed during the Identify Risks process.
- Sources of bias should be uncovered wherever possible, and their effect on the risk process should be managed proactively.
- The aim is to minimize subjectivity, and allow open and honest identification of as many risks as possible to the project.

Question

Which one of the following is NOT a critical success factor for risk identification?

A. Risk identification should be based on agreed-upon definitions
B. Risks should be clearly described
C. Risks should be linked to project objectives
D. Risk identification should be performed as early in the project lifecycle as possible

Correct Answer is A:
This is a critical success factor for qualitative analysis. The others are CSFs of risk identification.

Question

You are a project manager on your organization. You and your team started identify risk process using variety of tools and techniques to identify all the knowable risk. When does the identify risks process take place in the project?

A. At the executing stage
B. Throughout the project life cycle
C. At the initiating stage
D. At the planning stage.

Correct answer is B.
Since not all risks can be identified at any given point in the project, it is essential that risk identification is repeated throughout the project life cycle.
The reference is the practice standard for project risk management page #26

LESSON5. IDENTIFY RISKS PROCESS

Question

Question

Which of the following is the best definition of the Identify Risks process?

A. Measures the effect of a risk on one or more objectives of the project.

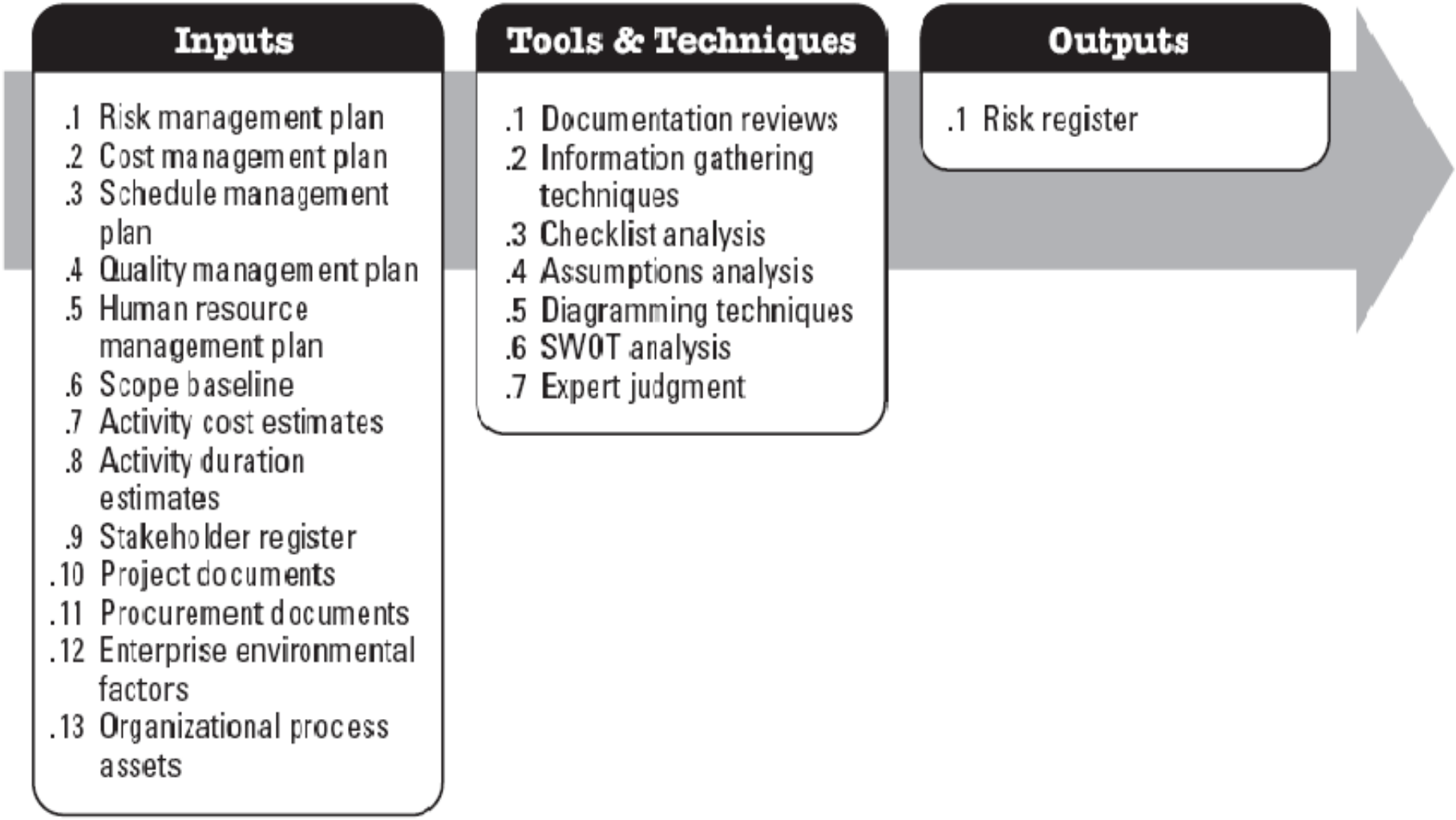
B. Documents the characteristics of a risk that may affect the project

C. Identifies threats and develops a plan in anticipation of a risk.

D. Identifies and tracks new risks that might arise during the ongoing project life cycle.

Correct answer is B:
Identify Risks is defined as the process of determining which risks may affect the project and documenting their characteristics.
Practice Standard for Project Risk Management, Page Number:109

LESSON5. IDENTIFY RISKS PROCESS
5.3 Inputs, Tools & Techniques, and Outputs



LESSON5. IDENTIFY RISKS PROCESS
5.3.1 Inputs

1- Risk Management Plan

Risk Management Plan includes	
1- Methodology	6- Definitions of risk probability& impact
2- Roles and responsibilities.	7- Probability and Impact Matrix
3- Budgeting	8- Revised stakeholders' tolerances
4- Timing.	9- Reporting formats
5- Risk categories	10- Tracking
And others	

LESSON5. IDENTIFY RISKS PROCESS
5.3.1 Inputs

2- Cost Management Plan

Provides processes and controls that can be used to help identify risks

LESSON5. IDENTIFY RISKS PROCESS
5.3.1 Inputs

3- Schedule Management Plan

Provides insight to project time/schedule objectives and expectations which may be impacted by risks (known and unknown).

LESSON5. IDENTIFY RISKS PROCESS
5.3.1 Inputs

4- Quality Management Plan

The quality management plan provides a baseline of quality measures and metrics for use in identifying risks.

LESSON5. IDENTIFY RISKS PROCESS
5.3.1 Inputs

5- Human Resource Management Plan

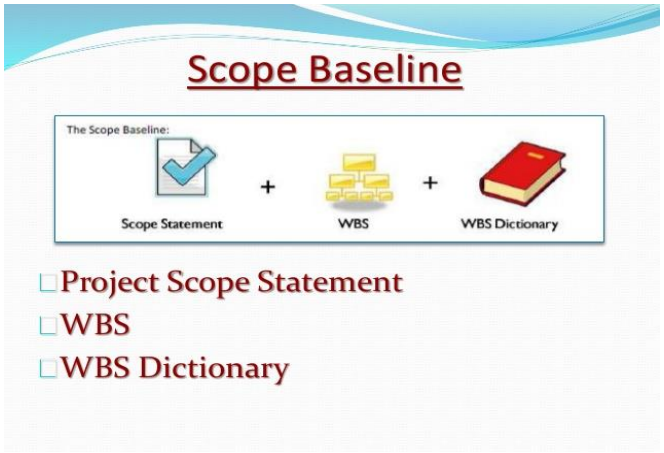
how project human resources should be defined, staffed, managed, and eventually released.

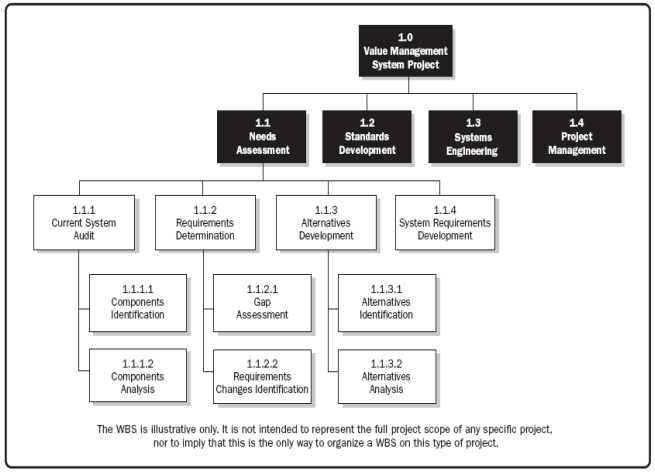
- ❑ **Roles and responsibilities.**
- ❑ **Project organization charts (graphic display of project team members and their reporting relationships.)**
- ❑ **Staffing management plan:** which form **a key input to identify risk process**. **describes when and how project team members will be acquired and how long they will be needed.**

LESSON5. IDENTIFY RISKS PROCESS
5.3.1 Inputs

6- Scope Baseline

- **Project assumptions** are found in the **project scope statement.**
  - project scope statement describe the project scope, major deliverables, assumptions.
  - Uncertainty in the assumptions should be evaluated as potential causes of risk.
- **WBS** is a critical input to identifying risks as it facilitates an understanding of potential risks at both the micro and macro levels.
  - Risks can be identified and tracked at summary, control account, and/or work package levels.




1.0 Value Management System Project
1.1 Needs Assessment
1.2 Standards Development
1.3 Systems Engineering
1.4 Project Management
1.1.1 Current System Audit
1.1.2 Requirements Determination
1.1.3 Alternatives Development
1.1.4 System Requirements Development
1.1.1.1 Components Identification
1.1.1.2 Components Analysis
1.1.2.1 Gap Assessment
1.1.2.2 Requirements Changes Identification
1.1.3.1 Alternatives Identification
1.1.3.2 Alternatives Analysis
The WBS is illustrative only. It is not intended to represent the full project scope of any specific project, nor to imply that this is the only way to organize a WBS on this type of project.

LESSON5. IDENTIFY RISKS PROCESS
5.3.1 Inputs

7- Activity Cost Estimates

Activity cost estimate reviews are useful in identifying risks

- **Activity cost estimate provide a quantitative assessment of .**
  - **The likely cost to complete scheduled activities.**
  - **Ideally are expressed as a range with, the width of the range indicating the degree(s) of risk.**

- **Review of the estimate indicates, that estimate is sufficient or insufficient to complete the activity.**

LESSON5. IDENTIFY RISKS PROCESS
5.3.1 Inputs

8- Activity Duration Estimates

- **Activity Duration Estimates are Useful in identifying risks related to the time allowances for the activities or project as a whole.**
- **The width of the range of the estimates indicating the relative degree(s) of risk.**

LESSON5. IDENTIFY RISKS PROCESS
5.3.1 Inputs

9- Stakeholder Register

- Provide Information about the stakeholders is useful for identifying risks.
- Ensure that key stakeholders(sponsor, and customer) are interviewed or otherwise participate during the Identify Risks process.

STAKEHOLDER REGISTER

Project Title: _____ Date Prepared: _____

Name	Position	Role	Contact Information	Requirements	Expectations	Influence	Classification

LESSON5. IDENTIFY RISKS PROCESS
5.3.1 Inputs

10- Project Documents

- ❑ Project charter.
- ❑ Project schedule.
- ❑ Schedule network diagrams.
- ❑ Issue log.
- ❑ Quality checklist.
- ❑--
- ❑--

Project Documents	
Activity attributes	Project staff assignments
Activity cost estimates	Project statement of work
Activity duration estimates	Quality checklists
Activity list	Quality control measurements
Activity resource requirements	Quality metrics
Agreements	Requirements documentation
Basis of estimates	Requirements traceability matrix
Change log	Resource breakdown structure
Change requests	Resource calendars
Forecasts • Cost forecast • Schedule forecast	Risk register
Issue log	Schedule data
Milestone list	Seller proposals
Procurement documents	Source selection criteria
Procurement statement of work	Stakeholder register
Project calendars	Team performance assessments
Project charter Project funding requirements Project schedule Project schedule network diagrams	Work performance data Work performance information Work performance reports

LESSON5. IDENTIFY RISKS PROCESS
5.3.1 Inputs

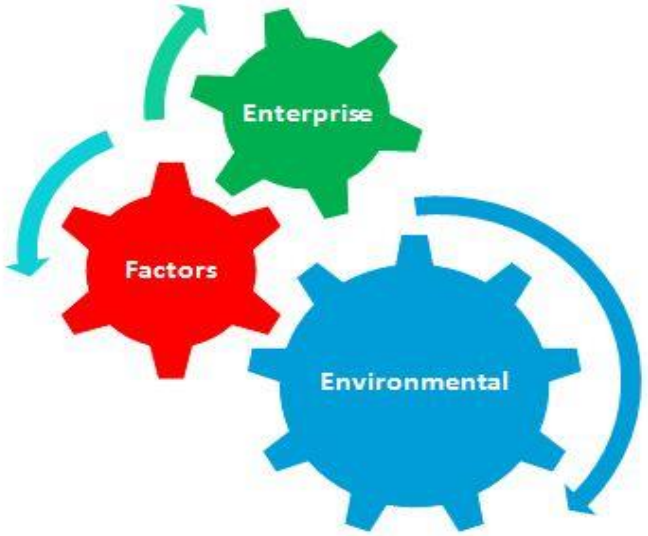
11- Procurement Documents

Procurement documents are **key input to the Identify Risks process**.
The complexity and the level of detail of the procurement documents should be consistent with the **value of, and risks associated** with, planned procurement.

- ❑ Request for information (**RFI**).
- ❑ Invitation for bid (**IFB**).
- ❑ Request for proposal (**RFP**).
- ❑ Request for quotation (**RFQ**).
- ❑ Tender notice.
- ❑ Invitation for negotiation.
- ❑ Invitation for seller's initial response.

LESSON5. IDENTIFY RISKS PROCESS
5.3.1 Inputs

12- Enterprise Environmental Factors

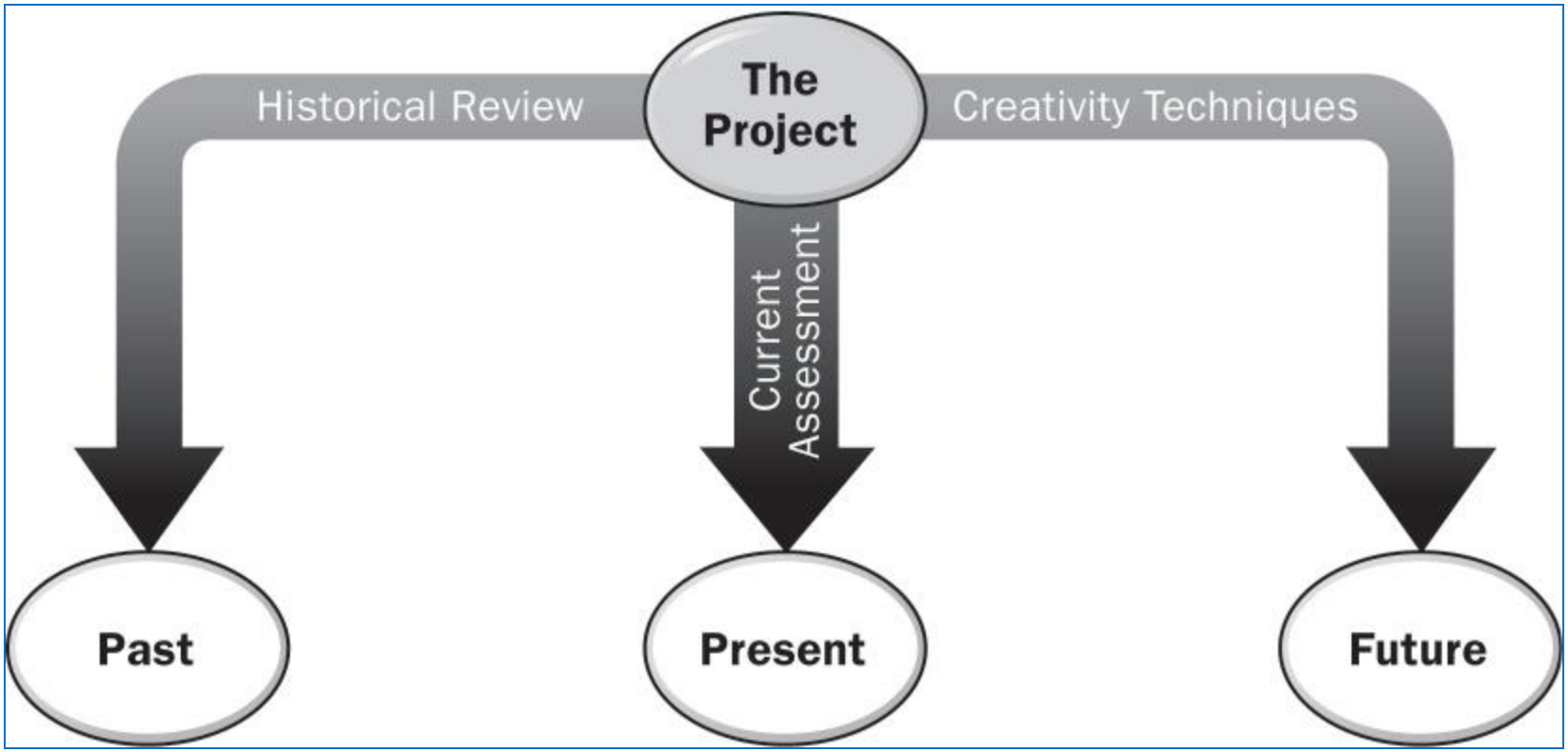


13- Organizational Process Assets

LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

Tools and Techniques categories

A range of tools and techniques is available for risk identification. These fall into the following three categories.



LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

Tools and Techniques categories

Historical Review

- Historical reviews are based on what occurred in the past, either on this project, or other similar projects in the same organization, or comparable projects in other organizations.
- Careful selection of comparable situations which are genuinely similar to the current project,
- Filtering of data to ensure that only relevant previous risks are considered.

- The risks identified in the selected historical situation should be considered, asking whether they or similar risks might arise in this project.

1- Post-project reviews/ Lessons Learned/ Historical Information.

2- Check Lists.

3- Industry knowledge base

LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

Tools and Techniques categories

Current assessments

- ❑ Rely on details of the current project.
- ❑ Analyzing its characteristics against given frameworks and models in order to expose areas of uncertainty.
- ❑ Do not rely on outside reference points.
- ❑ Based purely on examination of the project.

1- System Dynamics

2- Document review

3- Assumptions & Constraints Analysis

LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

Tools and Techniques categories

Creativity Techniques

- Encourages project stakeholders to use their imagination to find risks which might affect the project.
- The outcomes or effectiveness of these techniques depend on the ability of participants to think creatively.
- Used either singly or in groups.
- Employ varying degrees of structure.
- success is enhanced by use of a skilled facilitator.

1- brainstorming

2- Interviews

3- Nominal Group Techniques

LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

Tools and Techniques categories

- Each category has strengths and weaknesses.
- No single technique can reveal all knowable risks.
- No tools are complete nor can they replace original thinking.
- Identify Risks process use a combination of techniques, perhaps selecting one from each category. For example checklist (historical review), together with assumptions analysis (current assessment) and brainstorming (creativity).
- Categories of potential risks on the project by **RBS, a prompt list, or a set of generic list categories ensure that as many sources of risk as practicable have been addressed.**

LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

Tools and Techniques categories

The identified risks should be unambiguously described to ensure that the project risk process is focused on the actual risks not non-risks.

Risk formal structured Statement = Risk meta-language = three-part statements = Cause – Risk - Effect

Ensure clarity and distinguishing the risk ,cause(s) and effect(s),

"**As a result of cause, risk may occur, which would lead to effect.**"

LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

1- Documentation Reviews

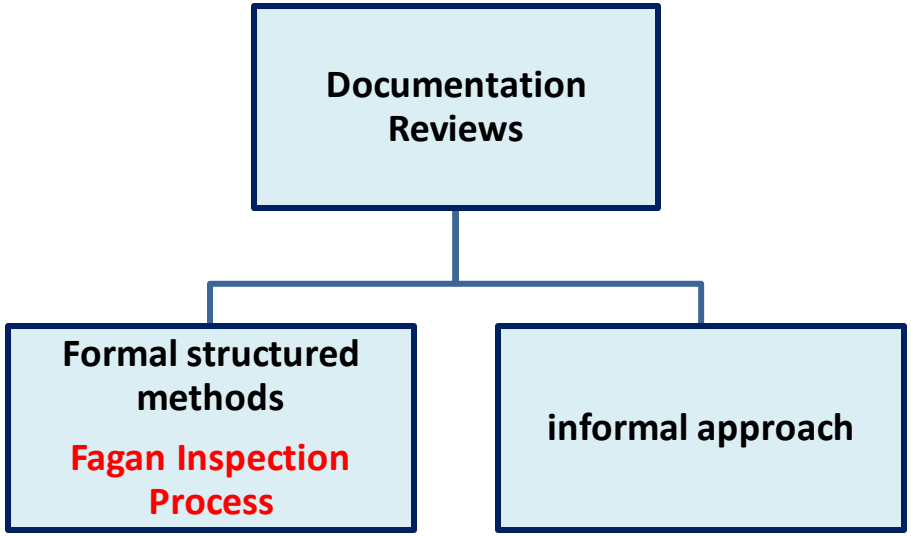
A structured review of the project documentation.

- ❑ Plans.
- ❑ Assumptions.
- ❑ Previous project files,
- ❑ Agreements.
- ❑ Project charter.
- ❑ Statement of work.
- ❑ Contract terms and conditions.
- ❑ Subcontracts.
- ❑ Technical specifications.
- ❑ Regulatory requirements.
- ❑ Legal stipulations

LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

1- Documentation Reviews contd.

The **quality** of the plans, as well as **consistency** between those **plans** and the **project requirements** and **assumptions**, may **be indicators of risk in the project.**



	Strengths	Weaknesses	CSFs
Documentation Reviews	• Exposes detailed project-specific risks • Requires no specialist tools	• Limited to risks contained in project documentation	• Understanding of relevance of prior experience

LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

2- Information Gathering Techniques

2.1- Brainstorming

obtain a comprehensive list of project risks in a facilitated risk identification workshop

Project risk ideas are generated under the **leadership of a facilitator,** either in

- ❑ A traditional free-form brainstorm session or
- ❑ Structured mass interviewing techniques.

LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

2- Information Gathering Techniques

2.1- Brainstorming

- The project team usually performs brainstorming, **often with a multidisciplinary set of experts who are not part of the Team. And can involve all key stakeholders.**

- **It** is common to **structure the risk identification brainstorm** using risk categories or a **RBS, Prompt list, Check list or WBS**.
  - **Risks are then identified and categorized by type of risk and their definitions are refined**.

- Proposed risks will be **evaluated** in the risk identification brainstorm **to remove non-risks**.

LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

TOOLS AND TECHNIQUES | 2- Information Gathering Techniques

2.1- Brainstorming

- **Facilitator** have to ensure active participation of relevant stakeholders in a risk identification brainstorm.
- **Facilitator** have to manage group dynamics carefully

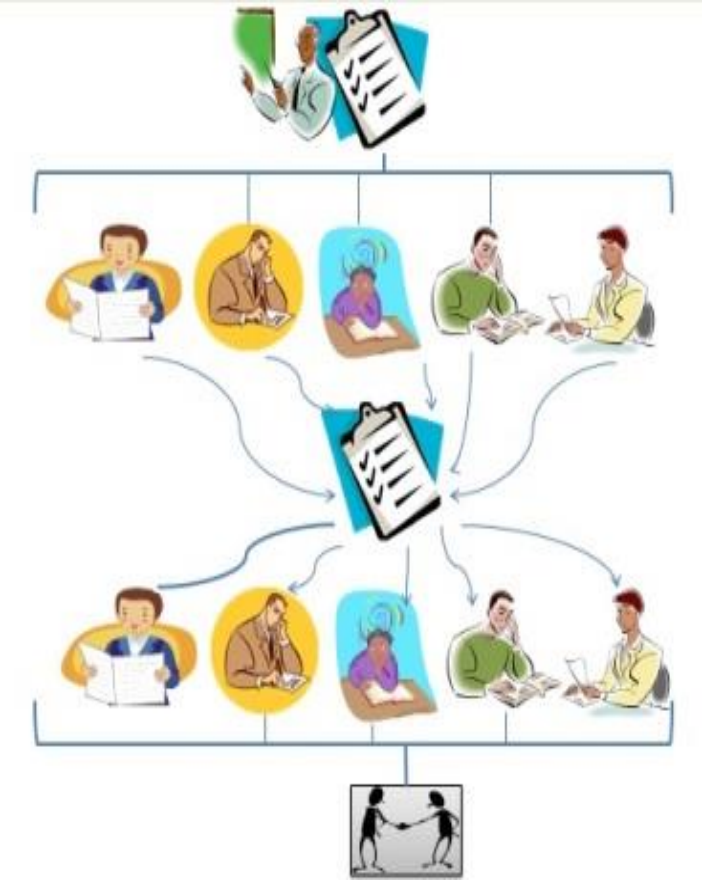
Technique	Strengths	Weaknesses	CSFs
Brainstorming	• Allows all participants to speak their mind and contribute to the discussion • Can involve all key stakeholders • Creative generation of ideas	• Requires attendance of key stakeholders at a workshop, therefore can be difficult to arrange and expensive • Prone to Groupthink and other group dynamics • May produce biased results if dominated by a strong person (often management) • Often not well facilitated • Generates non-risks and duplicates, requires filtering	• Attendance of representative group of stakeholders • Commitment to honesty • Preparation • Good facilitation • Use of structure (e.g. categories or RBS)

LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

2- Information Gathering Techniques

2.2- Delphi technique

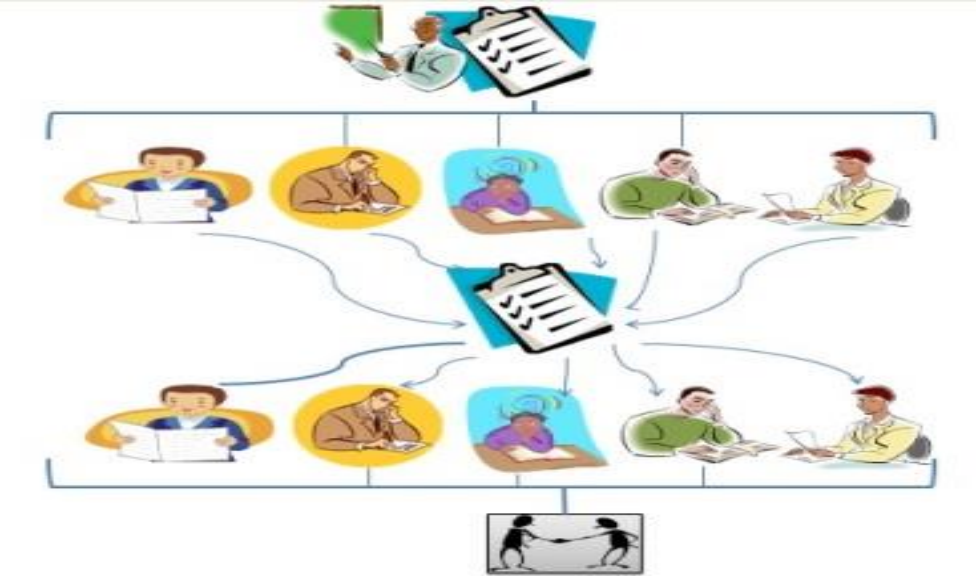
- The way to reach a **consensus of experts.**
- Project risk experts participate in this technique **anonymously.**
- **A facilitator** uses a questionnaire to solicit ideas about the important project risks.
- The responses are summarized and are then re-circulated to the experts for further comment.
- **Consensus** may be reached in a few rounds of this process.
- The Delphi technique helps **reduce bias** in the data and keeps any one person from having undue influence on the outcome.



LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

2- Information Gathering Techniques

2.2- Delphi technique



Technique	Strengths	Weaknesses	CSFs
Delphi Technique	• Captures input from technical experts • Removes sources of bias	• Limited to technical risks • Dependent on actual expertise of experts • May take longer time than available due to iterations of the experts' inputs	• Effective facilitation • Careful selection of experts • Clear definition of scope

LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

2- Information Gathering Techniques

2.3- Interviewing

- Interviews should include **all main stakeholders.**
- Conducted by **an independent skilled interviewer** using a structured agenda, in **an atmosphere** of confidentiality, honesty, and mutual trust.
- A risk breakdown structure, checklist or prompt list can be used as a framework for risk interviews.

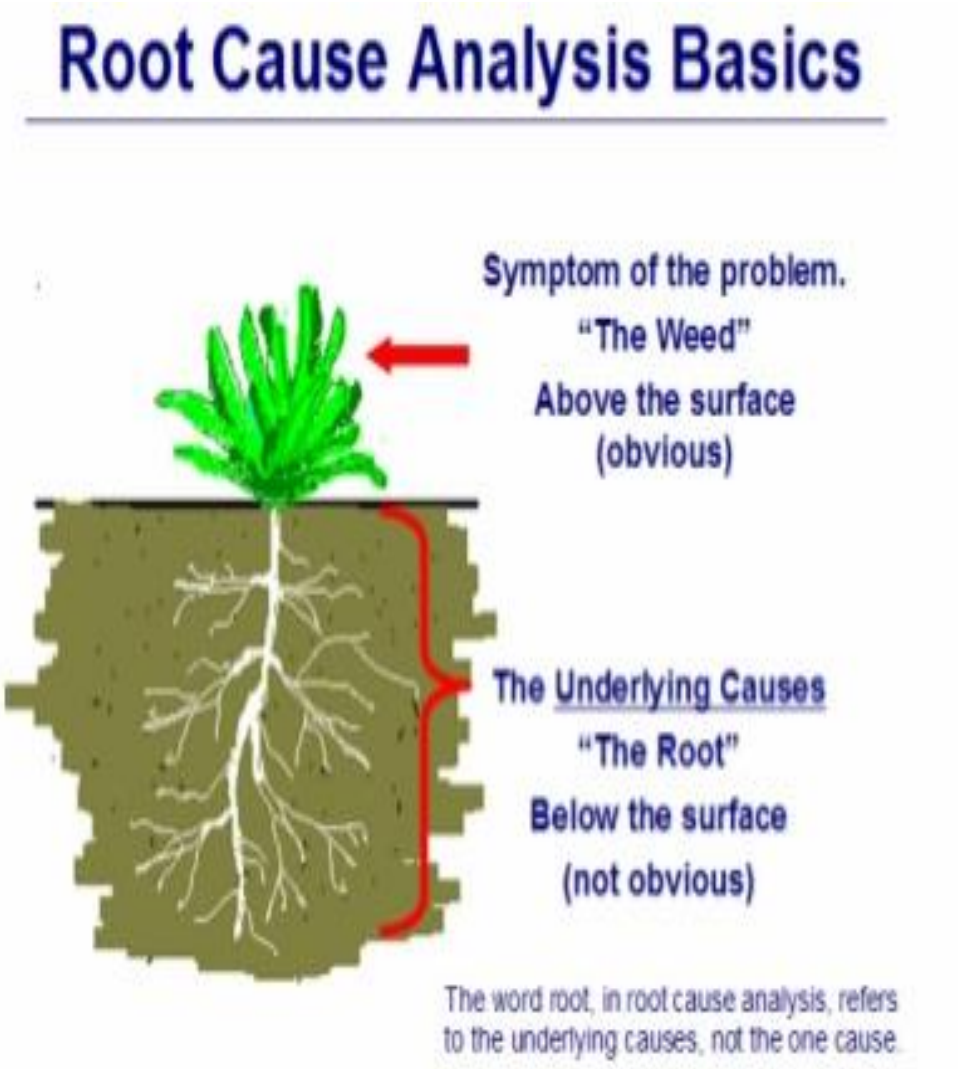
Technique	Strengths	Weaknesses	CSFs
Interviews	• Addresses risks in detail • Generates engagement of stakeholders	• Time consuming • Raises non-risks, concerns, issues, worries etc, so requires filtering	• Good interviewing and questioning skills • Environment of trust, openness, confidentiality • Preparation • Open relationship between interviewer and interviewee

LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

2- Information Gathering Techniques

2.4- Root cause analysis

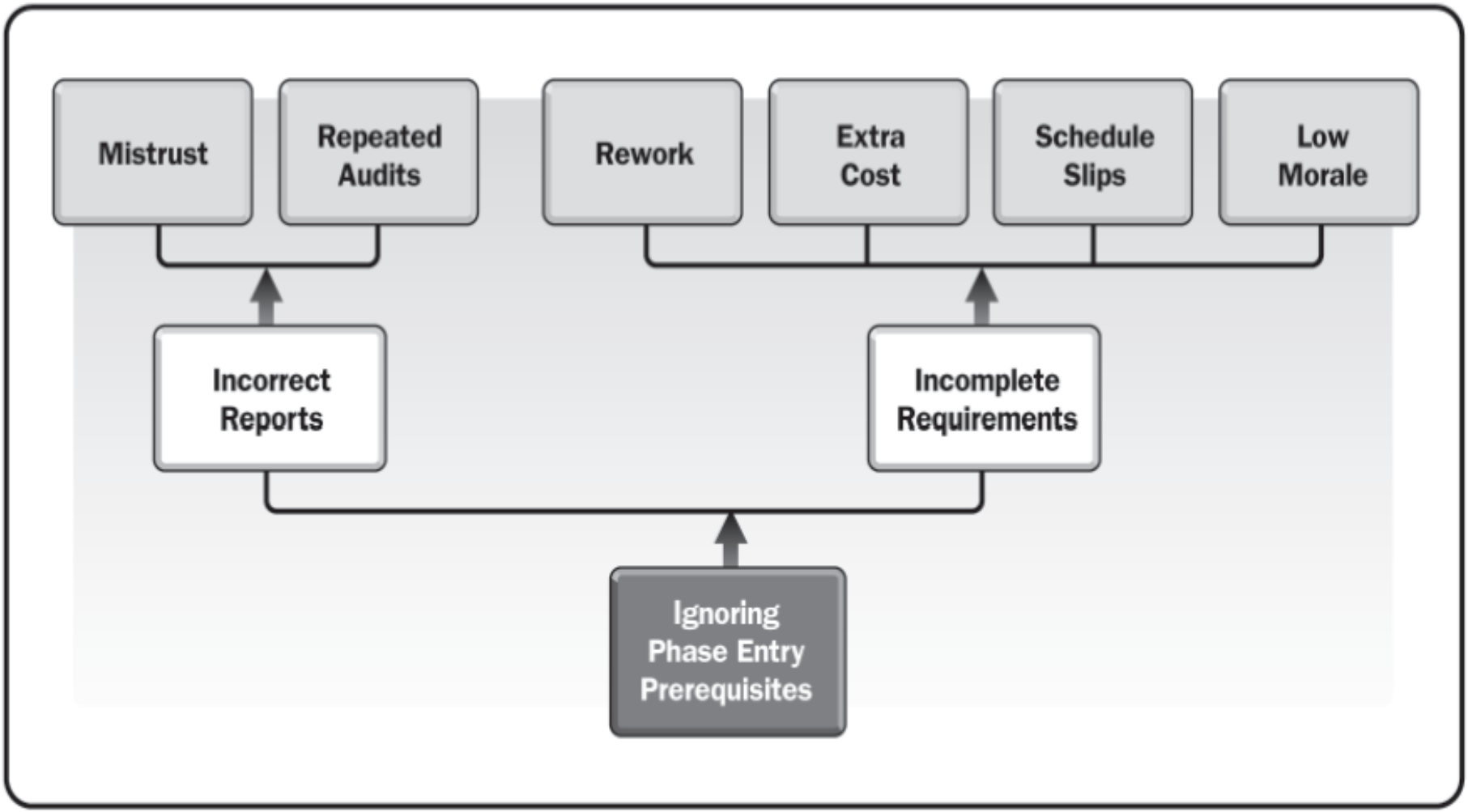
- Identify a problem, discover the underlying causes(may be visible symptoms of more fundamental forces) that lead to it, and develop preventive action.
- Identify common sources of several risks, leading to broad-reaching risk response strategies.
- Care needs to be taken when using this technique for risk identification to distinguish between risks (uncertain causes of the impact) and issues (certain causes of the impact).


Root Cause Analysis Basics
Symptom of the problem.
"The Weed"
Above the surface
(obvious)
The Underlying Causes
"The Root"
Below the surface
(not obvious)
The word root, in root cause analysis, refers to the underlying causes, not the one cause.

LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

2- Information Gathering Techniques

2.4- Root cause analysis



LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

2- Information Gathering Techniques

2.4- Root cause analysis

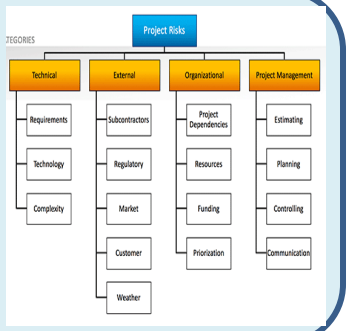
Technique	Strengths	Weaknesses	CSFs
Root-Cause Analysis → *see Chapter 6*	• Allows identification of additional, dependent risks • Allows the organization to identify risks that may be related because of their common root causes. • Basis for development of pre-emptive and comprehensive responses • Can serve to reduce apparent complexity	• Most risk management techniques are organized by individual risk. This organization is not conducive to identifying the root causes • Can oversimplify and hide existence of other potential causes • There may be no valid strategy available for addressing the root cause once it has been identified.	• Ability to identify if a risk is an outcome of a more fundamental cause • Willingness by management to accept and address the root cause rather than adopting partial workarounds

LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

3- Checklist Analysis

Developed based on historical information and from previous similar projects and other sources of information

The lowest level of the RBS can be risk checklist



Quick and Simple.
Not Exhaustive .

Should Include both threats and opportunities

Team should explore items that do not appear on the checklist.

Regular maintenance to **remove or archive** related items.

should be reviewed during project closure to incorporate new lessons learned and improve it for use on future projects.

LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

3- Checklist Analysis

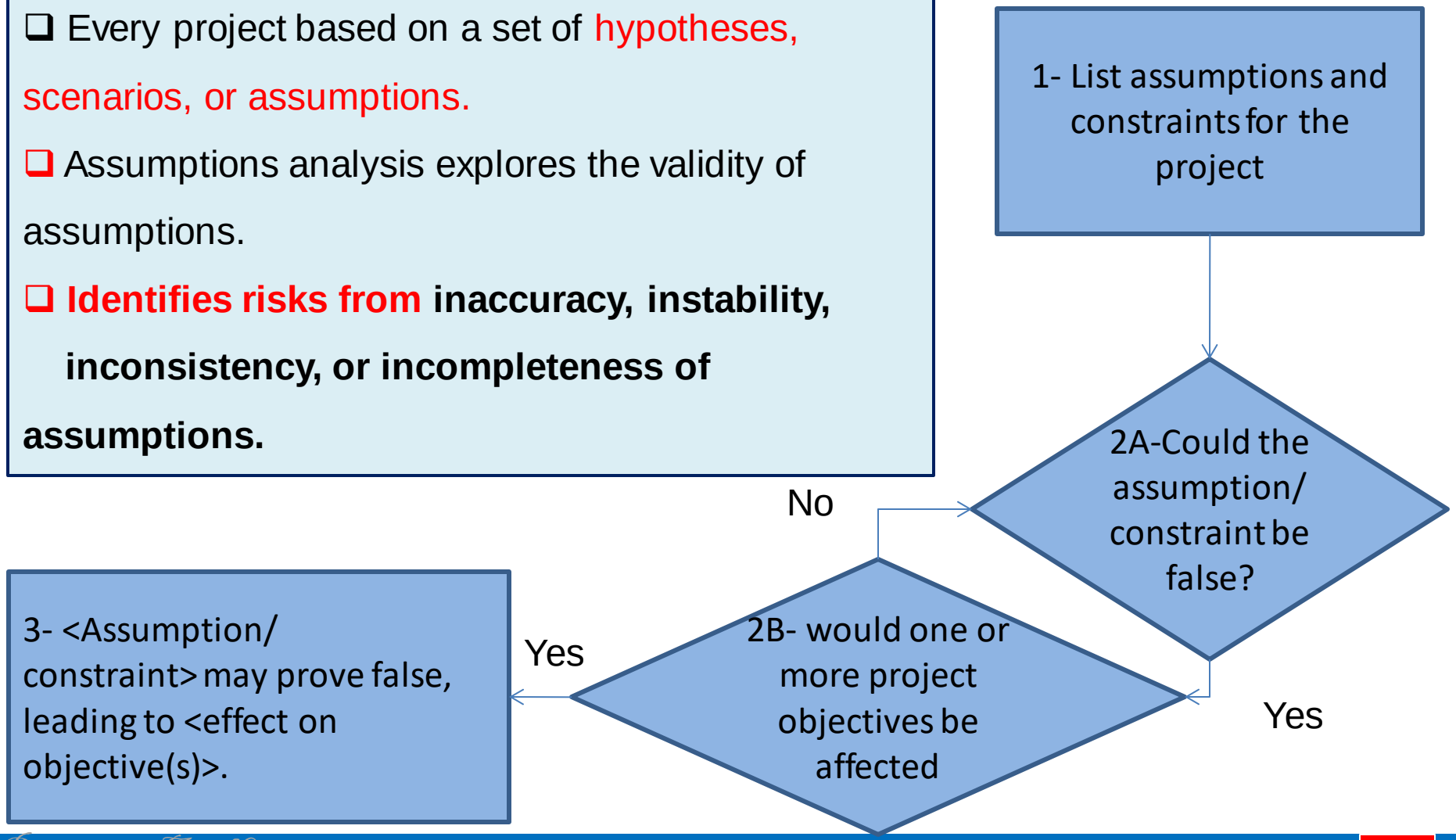
RISK CATEGORY	SUBCATEGORY	EXAMPLE RISKS	Could this risk affect our project? Yes, No Don't know, Not applicable
1. TECHNICAL RISK	1.1 Scope definition	Scope changes may arise during project.	
		Redundant scope may be discovered.	
		Etc...	
	1.2 Technical interfaces	Etc...	

Technique	Strengths	Weaknesses	CSFs
Check Lists	• Captures previous experience • Presents detailed list of risks	• Check list can grow to become unwieldy • Risks not on the list will be missed • Often only includes threats, misses opportunities	• Regular maintenance is required • Use of structure can assist (e.g. RBS)

LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

4- Assumptions and Constraints Analysis

- Every project based on a set of hypotheses, scenarios, or assumptions.
- Assumptions analysis explores the validity of assumptions.
- **Identifies risks from inaccuracy, instability, inconsistency, or incompleteness of assumptions.**



LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

4- Assumptions Analysis

Assumption or Constraint	Could this assumption/constraint prove false? (Y/N)	If false would it affect project? (Y/N)	Convert to a risk?

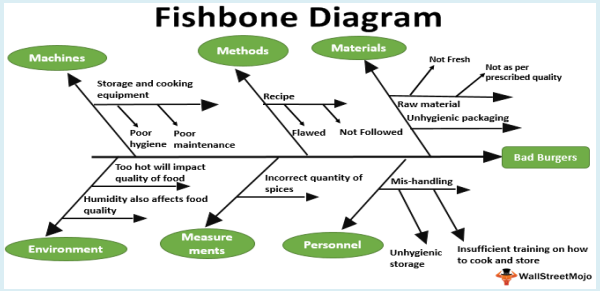
Technique	Strengths	Weaknesses	CSFs
Assumptions & Constraints Analysis	• Simple structured approach • Can be based on assumptions & constraints already listed in project charter • Generates project-specific risks	• Implicit/hidden assumptions or constraints are often missed	• Requires a comprehensive list of assumptions & constraints

LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

5- Diagramming Techniques

5.1- Cause and effect also know as (Ishikawa or fishbone) diagrams

- **Diagrammatic technique** form the causes which contribute to a given outcome.
- The body of the fish represent the causes.
- Each main cause can be split into sub-causes.

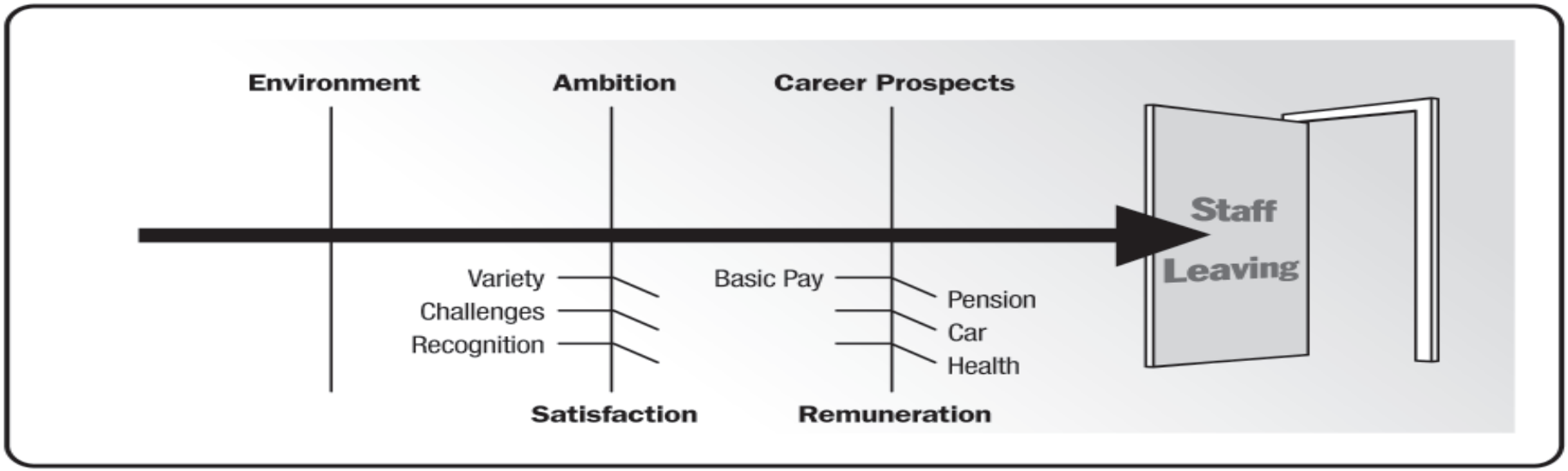


- the fish's head represent the effect on a project objective(the impact of a risk).
- Risks are the uncertain events which could result in occurrence of the impact.
- Care needs to be taken to **distinguish** between **risks** (uncertain causes of the impact) and **issues** (certain causes of the impact)

LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

5- Diagramming Techniques

5.1- Cause and effect also know as (Ishikawa or fishbone) diagrams



Technique	Strengths	Weaknesses	CSFs
Cause and Effect (Ishikawa) Diagrams	• Visual representation of project promotes structured thinking	• Diagram can quickly become over-complex	• Effective selection of critical impacts (e.g. by use of sensitivity analysis)

Question

While identifying risks on the project, the risk manager decides to use a tool/technique that limited to risks contained in project documentation and needs understanding of relevance of prior experience. What tool/technique are we talking about?

A. System dynamics
B. Document review.
C. Check list.
D. Expert Judgments.

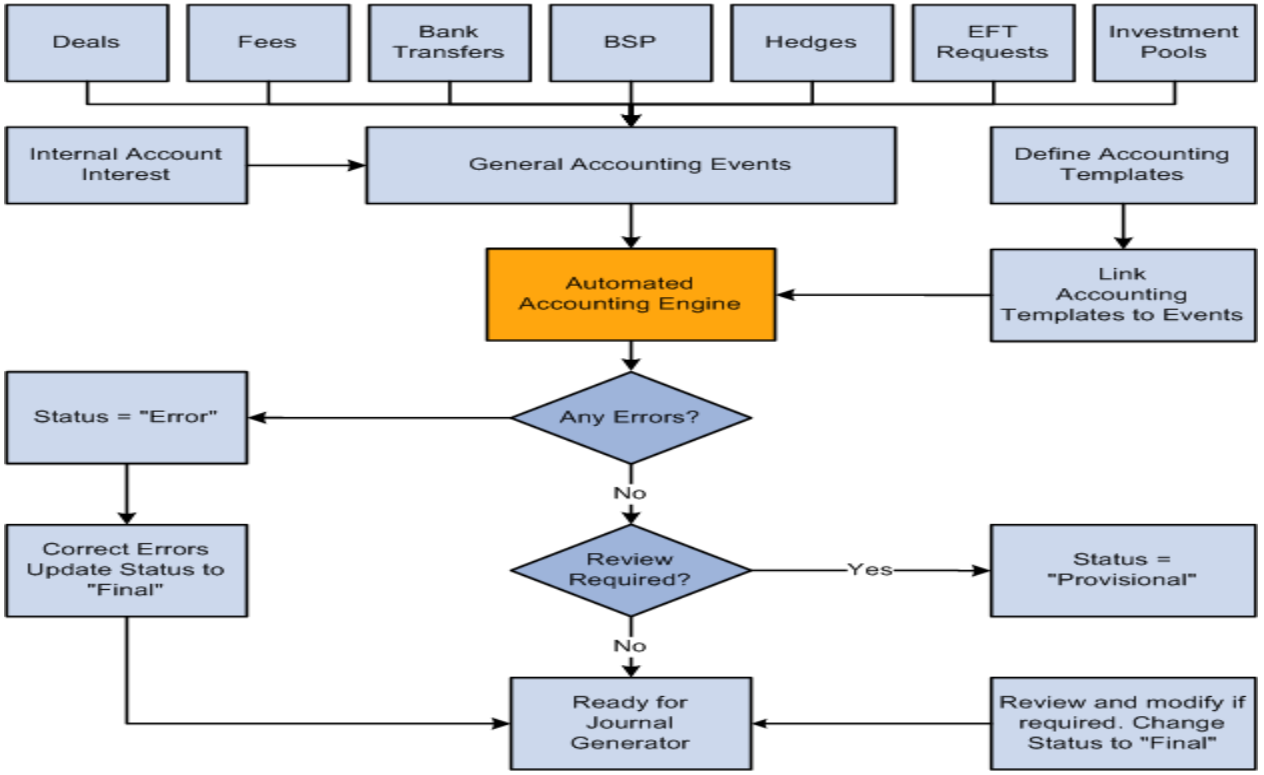
Correct answer is B.
"Exposes detailed project-specific risks and requires no specialist tools" are strengths of document review. "Limited to risks contained in project documentation" is weakness of document review.
" Understanding of relevance of prior experience" is critical success factor of document review. Reference: Practice Standard for Project Risk Management page #73.

LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

5- Diagramming Techniques

5-2- System or process flow charts

show how various elements of a system interrelate and the mechanism of causation.

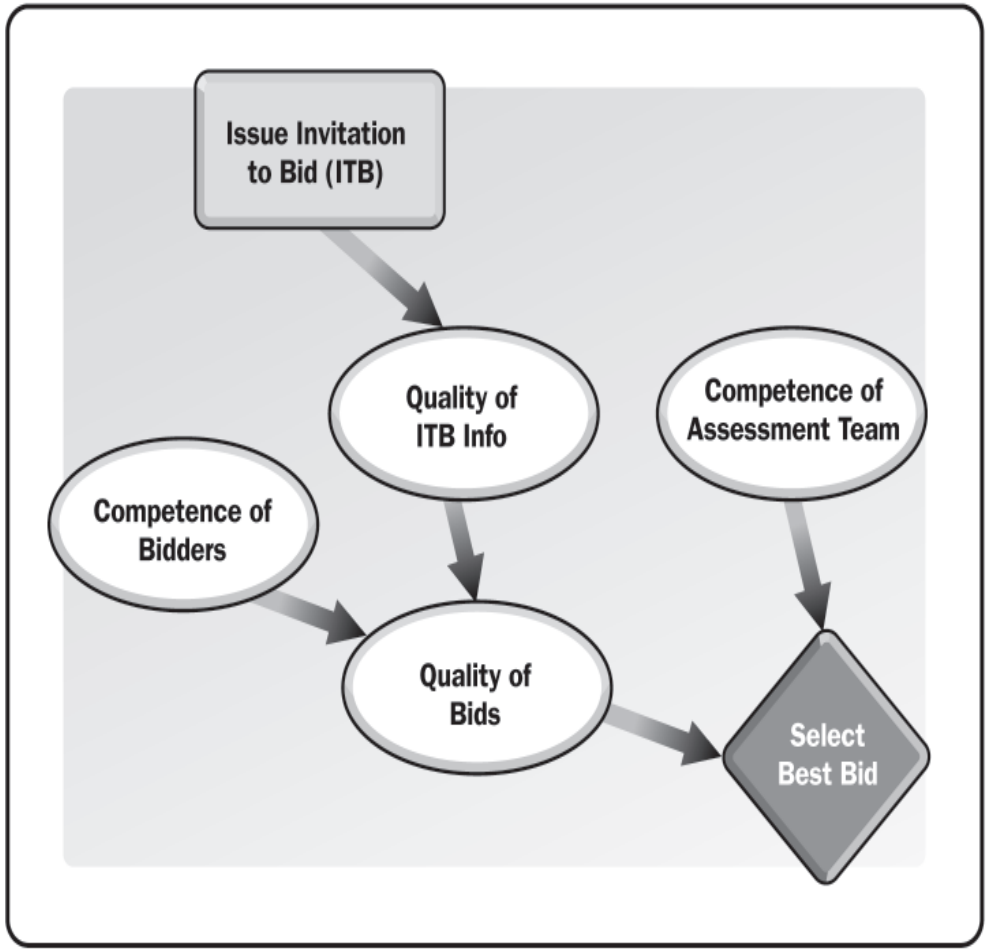


LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

5- Diagramming Techniques

5-2- Influence diagrams

- Graphical representations of situations showing:-
  - Causal influences.
  - Time ordering of events.
  - Relationships among variables and outcomes.
  - Main entities,
  - Decision points.
  - Uncertainties.
  - Outcomes.



LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

5- Diagramming Techniques

5-3- Influence diagrams

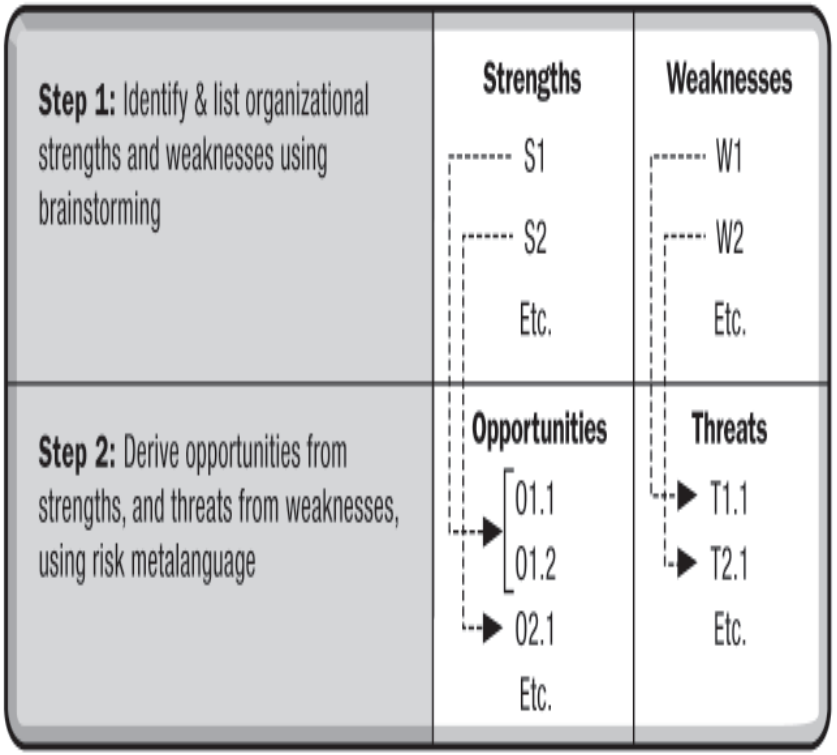
The influence diagram can identify risks when combined with sensitivity analysis or Monte Carlo simulation to reveal sources of risk within the project

Technique	Strengths	Weaknesses	CSFs
Influence diagrams	• Exposes key risk drivers • Can generate counter-intuitive insights not available through other techniques	• Requires disciplined thinking • Not always easy to determine appropriate structure	• Identify key areas to address

LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

6- SWOT Analysis

- Strengths, weaknesses, opportunities, and threats (**SWOT**) perspectives.
- To increase the range of identified risks by including internally generated risks.
- Identify Strengths and Weaknesses of the organization, focusing on either the project, organization or the business area in general.
- Identifies any Opportunities for the project that arise from Strengths.
- Identify Threats that arising from organizational Weaknesses.



LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

6- SWOT Analysis

- **SWOT** also examines the degree to which organizational strengths offset threats.
- Identifying opportunities that may serve to overcome weaknesses.
- The technique is commonly used in strategic decision making

Technique	Strengths	Weaknesses	CSFs
SWOT Analysis	• Ensures equal focus on both threats and opportunities • Offers a structured approach to identify threats and opportunities • Focus on internal (organizational strengths and weaknesses) and external (opportunities and threats)	• Focuses on internally generated risks arising from organizational strengths and weaknesses, excludes external risks • Tends to produce high-level generic risks, not project-specific	• Good facilitation • Strict adherence to the technique, to avoid confusing the four SWOT perspectives (i.e. between Strengths and Opportunities, or between Weaknesses and Threats)

LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

7- Expert Judgment

- Risks may be identified directly by SME with experience with similar projects or business areas.
- Experts should be identified by the project manager to consider all aspects of the project .
- Suggest possible risks based on their previous experience and areas of expertise.
- The experts' bias should be taken into account in this process.

Question

A diagrammatic representation of a project situation, showing the main entities, decision points, uncertainties, and outcomes, and indicating the relationships between them. What are we taking about?

A. Fault Tree Analysis
B. Cause and Effect Diagrams
C. Influence Diagrams
D. Monte Carlo Simulation

Correct answer is C:
Influence Diagram is a diagrammatic representation of a project situation, showing the main entities, decision points, uncertainties, and outcomes, and indicating the relationships between them. It can identify risks when combined with sensitivity analysis or Monte Carlo simulation to reveal sources of risk within the project. Practice Standard Page #:80

Question

Kelly is a project manager of MAC project for her organization MOGA Inc. She and the project team are identifying the project risks using a simple structured approach based on hypothesis and limitations already listed in project charter. What is that technique?

A. Variance analysis.
B. Expert Judgments.
C. Assumptions & constraints analysis.
D. Sensitivity analysis.

Correct answer is C.
"Simple structured approach" and "based on assumptions & constraints already listed in project charter" are strengths of Assumptions & constraints analysis. Reference: Practice Standard for Project Risk Management page#72.

Question

A tool/technique of identify risk process provides visual representation of project promotes structured thinking and its diagram can quickly become over-complex. What technique are we talking about?

A. Cause and effect.
B. Document review.
C. AHP.
D. Monte Carlo.

Correct answer is A.
"visual representation of project promotes structured thinking" is a strength of cause and effect diagram."Diagram can quickly become over-complex) is a weakness of cause and effect diagram. Reference: Practice Standard for Project Risk Management page #72.

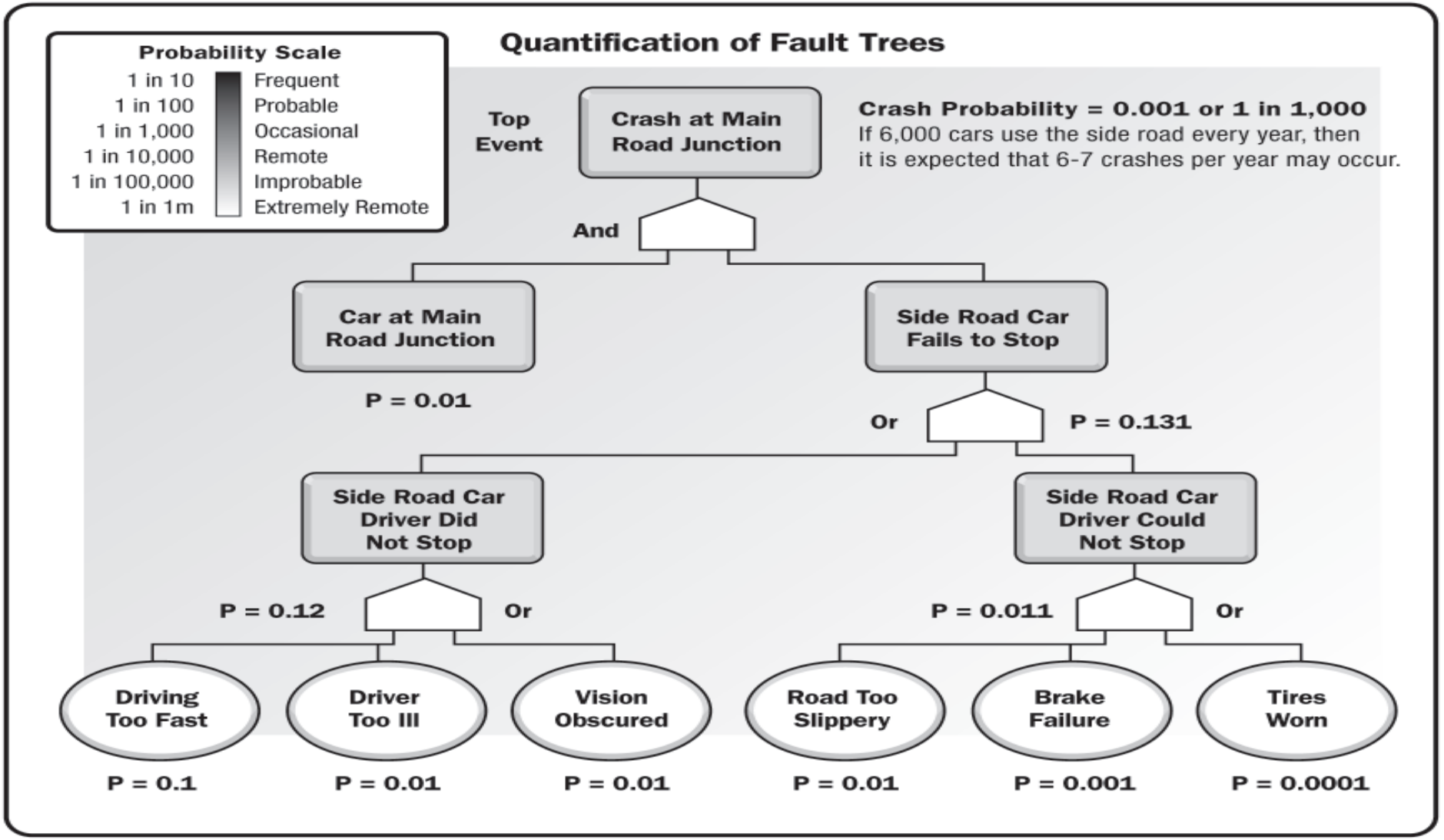
LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

8- Failure Modes and Effects Analysis FMEA/Fault Tree Analysis

- Analysis of a model structured to identify the various elements that can cause system failure by themselves, or in combination with others, based on the logic of the system.
- Identify risks by analyzing how risk impacts might arise.
- The probability of failure (or of reliability, mean time between failure, etc.) of the overall system.
- level of quality of the system or product.
- If the level of reliability is not acceptable, the Fault Tree can indicate where the system can be made more reliable.
- Used in engineering contexts.
- Useful in the design and engineering phase of the project

LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

8- FMEA/Fault Tree Analysis



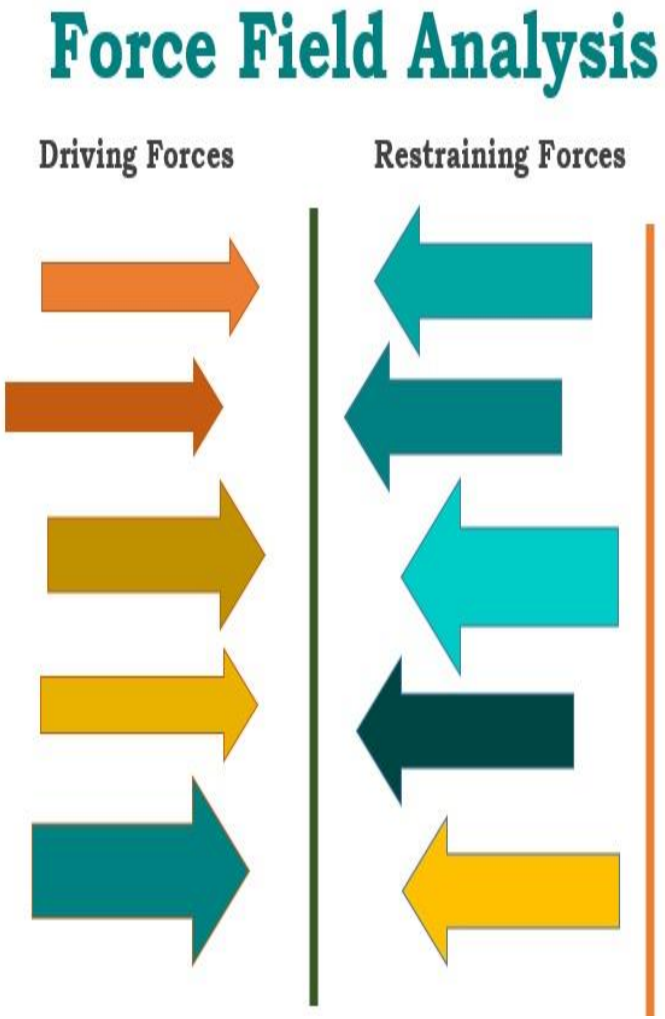
LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

8- FMEA/Fault Tree Analysis

Technique	Strengths	Weaknesses	CSFs
FMEA/Fault Tree Analysis	• Structured approach, well understood by engineers • Produces an estimate of overall reliability using quantitative tools • Good tool support	• Focuses on threats, not so useful for opportunities • Requires expert tools not generally available to those except experts	• Detailed description of the area being assessed • Statistically accurate data on fault probabilities for many events

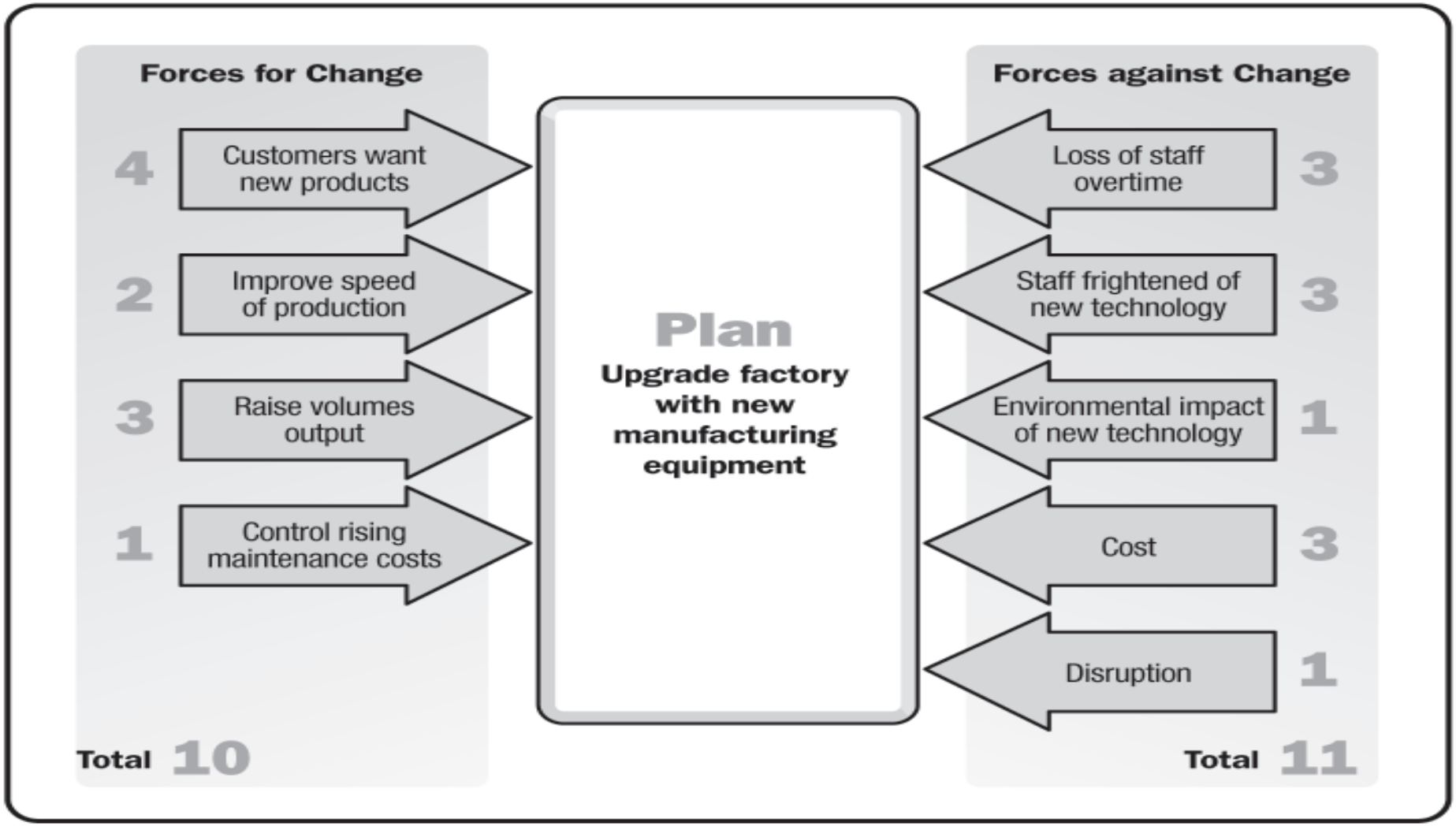
9- Force Field Analysis

- Used in the change management context.
- Identifying driving forces("forces for change") and restraining forces ("forces against change") which currently affect achievement of a project objective.
- Risks can then be identified as uncertain events or conditions which would lead to change in the strength of one or more of the identified forces



LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

9- Force Field Analysis



LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

9- Force Field Analysis

Technique	Strengths	Weaknesses	CSFs
Force Field Analysis	• Creates deep understanding of factors that affect project objectives	• Time-consuming and complex technique • Usually only applied to a single objective, so does not provide whole-project view	• Prioritized objectives

LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

10- Industry Knowledge Base

An industry knowledge base is a special case of a checklist, and is used similarly

Technique	Strengths	Weaknesses	CSFs
Industry knowledge base	• Captures previous experience • Allows benchmarking against external organisations	• Limited to what has previously happened • Excludes project-specific risks	• Access to relevant information

LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

11- Nominal Group Technique

- A technique that enhances brainstorming with a voting process used to rank the most useful ideas for further brainstorming or for prioritization.
- Participants share and discuss all issues before evaluation.
- Each participant participating equally in evaluation.

Technique	Strengths	Weaknesses	CSFs
Nominal Group Technique	• Encourages and allows all participants to contribute • Allows for different levels of competence in common language • To a large extent, auto-documenting • Provides ideal base for affinity diagramming (grouping by risk categories for use in the Risk Breakdown Structure and Root Cause Analysis)	• Can lead to frustration in dominant members who feel it is moving slowly	• Good briefing of all participants in the technique • Strict facilitation

Question

A tool/technique of identify risk process that ensures equal focus on both threats and opportunities and have four perspectives. What technique are we talking about?

A. Interviews.
B. Document review.
C. SWOT Analysis.
D. Expert Judgments

Correct answer is C.

"Ensures equal focus on both threats and opportunities.
Offers a structured approach to identify threats and opportunities.
Focus on internal (organizational strengths and weaknesses) and external (opportunities and threats)" are strengths of SWOT Analysis.
"Focuses on internally generated risks arising from organizational strengths and weaknesses, excludes external risks. Tends to produce high level generic risks, not project-specific" are weaknesses of SWOT Analysis.
"Good facilitation. Strict adherence to the technique, to avoid confusing the four SWOT perspectives (i.e. between Strengths and Opportunities, or between Weaknesses and Threats)" are critical success factors SWOT analysis. Reference: Practice Standard for Project Risk Management page#75.

Question

A technique can identify points support change and points against change. What is this technique?

A. AHP.
B. Force Field analysis.
C. RBS.
D. FMEA/Fault Tree Analysis.

Correct answer is B.
Force Field Analysis is typically used in the change management context. It can be adapted for risk identification by identifying driving forces ("forces for change") and restraining forces ("forces against change") which currently affect achievement of a project objective. The reference is risk practice standard Page #79.

LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

12- Post-Project Reviews/Lessons Learned/Historical Information

- Reviewing databases of risks which occurred in previous similar situations.
- Such databases.
  from post-project reviews lessons learned exercises or repositories of historical information, either within an organization or industry body

Technique	Strengths	Weaknesses	CSFs
Post-project reviews/ Lessons Learned/ Historical Information	• Leverages previous experience • Prevents making the same mistakes or missing the same opportunities twice • Enhances the Organizational Process Assets	• Limited to those risks that have occurred previously • Information is frequently incomplete: details of past risks may not include details of successful resolution; ineffective strategies are rarely documented.	• Well structured project lessons learned database • Participation of previous project team members (ideally including the project manager)

LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

13- Prompt Lists

- Set of risk categories which can be used to stimulate risk identification.
- The prompt list may be presented as:-
  - **Risk breakdown structure.**
  - **Set of headings.**
- Used as a framework for brainstorming or risk interviews

Standard prompt lists		
The PESTLE prompt list	**The TECOP prompt list**	**The SPECTRUM prompt list**
• Political • Economic • Social • Technological • Legal • Environmental	• Technical • Environmental • Commercial • Operational • Political	• Socio-cultural • Political • Economic • Competitive • Technology • Regulatory/legal • Uncertainty/risk • Market

LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

13- Prompt Lists

Technique	Strengths	Weaknesses	CSFs
Prompt Lists	• Ensures coverage of all types of risk • Stimulates creativity	• Topics can be too high level	• Choice of list relevant to the project and its environment

LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

14- Questionnaire

- Questionnaire can be presented as a **special form of checklist**.
  for example “Is the client’s requirement clearly defined?”) rather than risk statements (“The client may change the requirement after project start.”).

- Questionnaire can be used to **present the headings from a prompt.**
  Asking questions such as “Are there any uncertainties arising from the use of technology on this project?”

Technique	Strengths	Weaknesses	CSFs
Questionnaire	• Encourages broad thinking to identify risks	• Success depends on the quality of the questions • Limited to the topics covered by the questions • Can be a simple reformatting of a checklist	• Clear and unambiguous questions • Detailed briefing of respondents

15- Risk Breakdown Structure (RBS)

Grouping potential causes of risk. As **Risk Breakdown Structure (RBS)**

RBS
Hierarchical representation of risks by risk categories.

OR

Hierarchical framework of potential sources of risk.

- ❑ Generic RBS
- ❑ Project-specific RBS

RBS LEVEL 0	RBS LEVEL 1	RBS LEVEL 2
ALL SOURCES OF PROJECT RISK	1. TECHNICAL RISK	1.1 Scope definition
		1.2 Requirements definition
		1.3 Estimates, assumptions, and constraints
		1.4 Technical processes
		1.5 Technology
		1.6 Technical interfaces
		Etc.
	2. MANAGEMENT RISK	2.1 Project management
		2.2 Program/portfolio management
		2.3 Operations management
		2.4 Organization
		2.5 Resourcing
		2.6 Communication
		Etc.
	3. COMMERCIAL RISK	3.1 Contractual terms and conditions
		3.2 Internal procurement
		3.3 Suppliers and vendors
		3.4 Subcontracts
		3.5 Client/customer stability
		3.6 Partnerships and joint ventures
		Etc.
	4. EXTERNAL RISK	4.1 Legislation
		4.2 Exchange rates
		4.3 Site/facilities
		4.4 Environmental/weather
		4.5 Competition
		4.6 Regulatory
		Etc.

LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

15- Risk Breakdown Structure (RBS)

Technique	Strengths	Weaknesses	CSFs
Risk Breakdown Structure (RBS)	• Offers a framework for other risk identification techniques such as brainstorming • Ensures coverage of all types of risk • Tests for blind spots or omissions	• None	• Requires a comprehensive RBS, often tailored to the project

Question

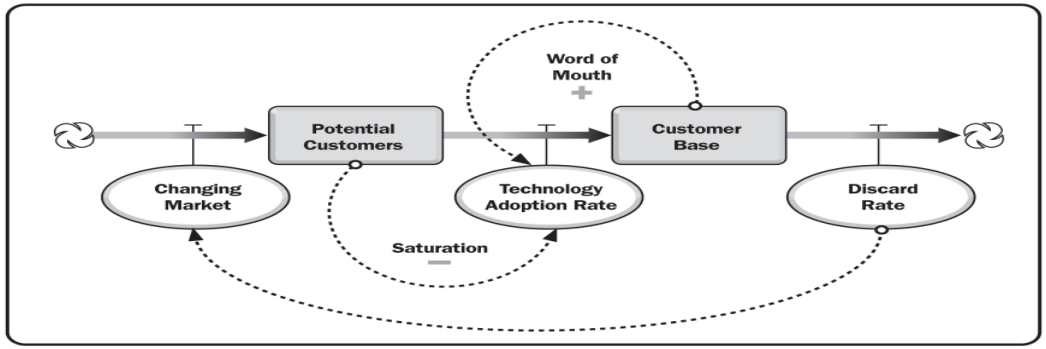
Michael has been assigned as a project manager of a construction project for his organization in California. He and his team are discussing some aspects to ensure coverage of all types of risk and Stimulates creativity. Which of the following can help?

A. Force field analysis.
B. Prompt lists.
C. Reserve analysis.
D. Post-project reviews/ Lessons Learned/ Historical Information technique.

Correct answer is B.
"Ensures coverage of all types of risk and Stimulates creativity." are strengths of the prompt lists. "Topics can be too high level." is a weakness of the prompt lists.
"Choice of list relevant to the project and its environment." is a critical success factor of the prompt lists. Reference: Practice Standard for Project Risk Management page #74.

LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

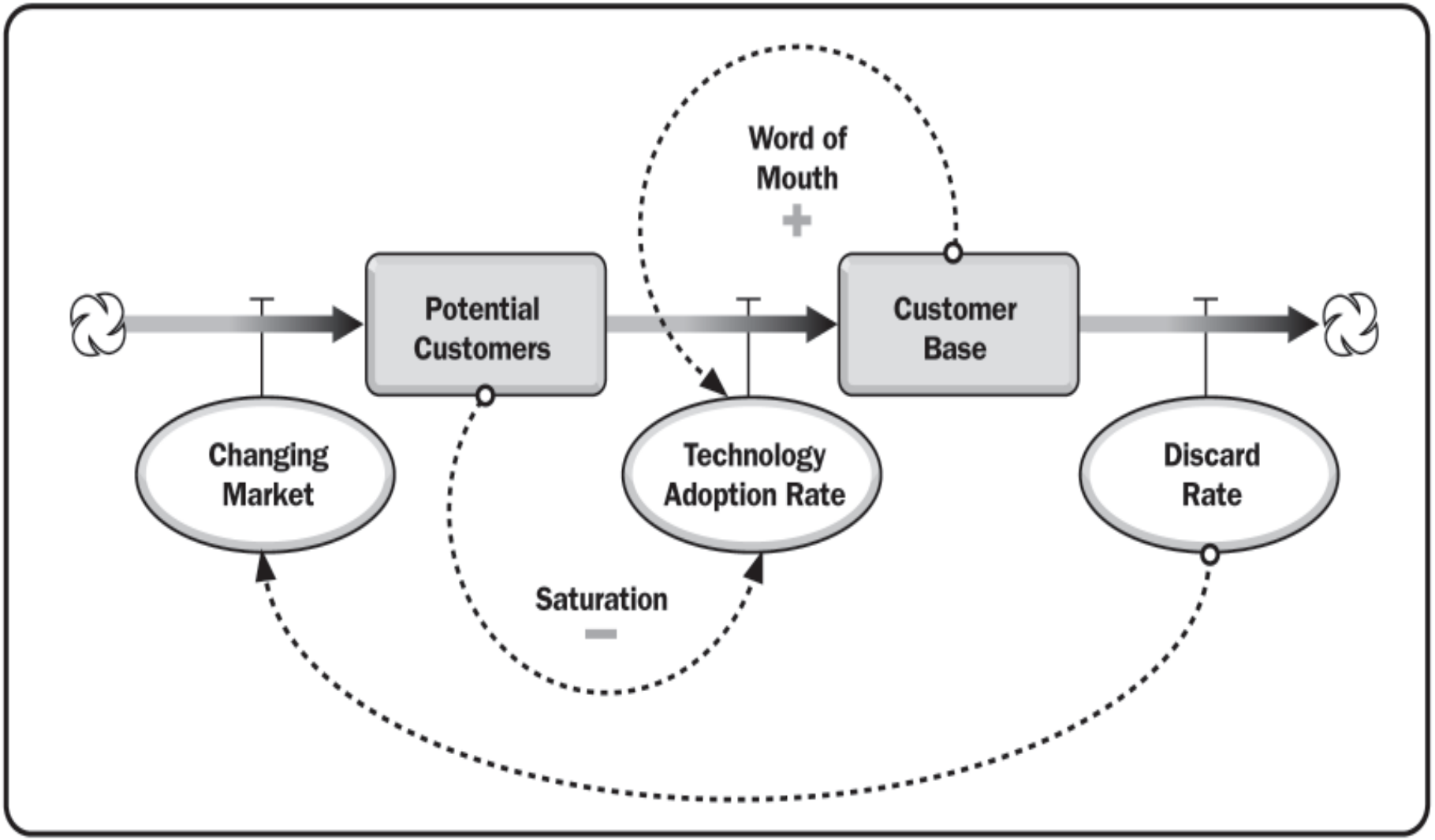
16- System Dynamics (SD)



- SD is a particular application **of influence diagrams.**
- Can be used to identify risks within a project situation.
- The SD model represents entities and information flows within a project.
- Analysis of the model can reveal **feed-back** and **feed-forward loops** which lead to uncertainty or instability.
- The results of an SD analysis can show the **impact of risk events** on **overall project cost or schedule to be expected.**
- Analyses of changes in the model or assumptions can indicate the system's sensitivity to specific events, some of which may be risks.

LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

16- System Dynamics



LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

16- System Dynamics

Technique	Strengths	Weaknesses	CSFs
System Dynamics → *see Chapter 715*	• Exposes unexpected inter-relations between project elements (feedback and feed-forward loops) • Can generate counter-intuitive insights not available through other techniques • Produces overall impacts of all included events and risks	• Requires specialized software and expertise to build models • Focuses on impacts but difficult to include the concept of probability	• Understanding of feedback • Competence in applying tools and understanding their output • Quality of the system model • Accuracy of input data collected for the specific project

Question

A prompt list is a predetermined set of risk categories which is used to stimulate risk identification. Which of the following are standard prompt lists?

A. PISTLE ,SPECTRUM and TECOP.
B. PISTLE, TECUP and SPECTRUM
C. TECUP, PESTLE and SPECTRUM.
D. PESTLE, TECOP and SPECTRUM

Correct Answer is D:
PESTLE, TECOP and SPECTRUM are all standard prompt lists.

LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

17- WBS Review (WBS)

Can form a framework for a number of other risk identification techniques, such as

- Brainstorming.
- Risk interviews.
- Checklists.
- Prompt lists

Technique	Strengths	Weaknesses	CSFs
WBS Review	• Ensures all elements of the project scope are considered • Provides for risks related to different levels of detail (from high-level to those related to individual work packages)	• Excludes external risks or those not specifically related to WBS elements	• Good WBS

Question

You are the project manager of ZARO project. While you are in the identification risk process, the risk manager suggest a model that represents entities and information flows within a project, and analysis of the model can reveal feed-back and feed-forward loops which lead to uncertainty or instability. What is the technique?

A. FMEA/Fault tree analysis.
B. System Dynamics.
C. Force Filed Analysis.
D. AHP.

Correct answer is B.
The SD model represents entities and information flows within a project, and analysis of the model can reveal feed-back and feed-forward loops which lead to uncertainty or instability, the reference is the practice standard for project risk management page #85

LESSON5. IDENTIFY RISKS PROCESS

Question

Question

A model structured to identify the various elements that can cause system failure by themselves, or in combination with others , determine probability of failure of the overall system, indicating the level of quality of the system or product and If the level of reliability is not acceptable the technique can indicate where the system can be made more reliable. What is the technique?

A. SD.
B. AHP.
C. Latin hypercube.
D. FMEA/Fault tree analysis.

Correct answer is D.
Failure Modes and Effects Analysis (FMEA) or Fault Tree Analysis is the analysis of a model structured to
Identify the various elements that can cause system failure by themselves, or in combination with others, the reference is the practice standard for project risk management page #78

LESSON5. IDENTIFY RISKS PROCESS
5.3 .3 OUTPUTS

Risk Register

- The main output from the Identify Risks process is the risk register that recording all relevant information currently available for each identified risks.
- Then becomes available to other project management and risk management processes.
- Contains the outcomes of the other risk management processes as they are conducted.
- The level and type of information contained in the register increase over time.

Risk Identification				Risk Response	
Risk describtion	Causes	Effects	ROOT Cause	Potential Risk Response	Nominated Risk Owner

LESSON5. IDENTIFY RISKS PROCESS
5.3 .3 OUTPUTS

Risk Register

The risk register include

1- List of identified risks.

The identified risks are described in as much detail as is reasonable.

- **Description** " If CAUSE exists, EVENT may occur leading to EFFECT'
- **Root causes** of risks.
  - ❖ Are the fundamental conditions or events that may give rise to one or more identified risks.
  - ❖ They should be recorded and used to support future risk identification for this and other projects.
- **Nominated risk owner** for each risk,.
- **Trigger conditions.**
- **Causes and Effects**

2- List of potential (preliminary) responses.

may sometimes be identified during the Identify Risks process.
These responses, if identified in this process, should be used as inputs to the Plan Risk Responses process.

Question

Neuro-linguistic programming (NLP) use in.

A. Stakeholders Analysis.
B. Computer programming.
C. Create rapport between participants.
D. Stakeholder's engagement.

Correct answer is C.

No reference in Pmbok5 and practice standard but it is very important to know that Neuro-linguistic programming NLP create rapport between participants.

LESSON5. IDENTIFY RISKS PROCESS
5.3 .2 Tools & Techniques

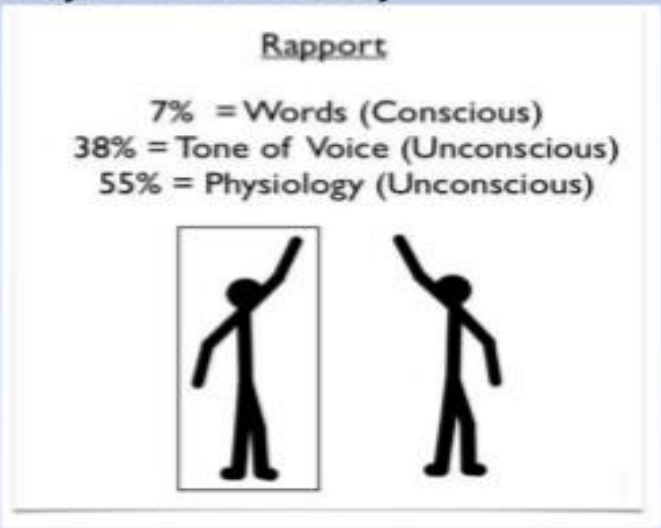
Neuro linguistic programming

How to Apply NLP(Rapport)

- **Rapport**

Building rapport with clients and friends by using effective nlp methods mirror and matching.

By matching and mirroring one's words, tone of voice and physiology rapport can be built conciously or unconciously.



RMP COACH

PROJECT RISK MANAGEMENT Course

PMI-RMP

LESSON 6
Perform Qualitative Risk Analysis

Engr. ALAA SULTAN
Senior Project Manager
PgMP, PMP, PMI-RMP, OCP, 6SIGMA

PROJECT RISK MANAGEMENT PMI-RMP

Exam Content Outline

Domain 2: Stakeholder Engagement

Activities related to promoting the understanding of project risk management for stakeholders and project team members, assessing stakeholder risk tolerance, prioritizing project risk, and promoting risk ownership.

Tasks	Stakeholder Engagement (19–20%)
Task 1	Promote a common understanding of the value of risk management by using interpersonal skills in order to foster an appropriate level of shared accountability, responsibility, and risk ownership.
Task 2	Train, coach, and educate stakeholders in risk principles and processes in order to create shared understanding of principles and processes, and foster engagement in risk management.
Task 3	Coach project team members in implementing risk processes in order to ensure the consistent application of risk processes.
Task 4	Assess stakeholder risk tolerance using processes and tools such as interviewing stakeholders and reviewing historical stakeholder behaviors in order to identify project risk thresholds.

PROJECT RISK MANAGEMENT PMI-RMP

Exam Content Outline

Tasks	Stakeholder Engagement (19–20%)
Task 5	Identify stakeholder risk attitudes and cognitive biases using stakeholder analysis techniques in order to manage stakeholder expectations and responses throughout the life of the project.
Task 6	Engage stakeholders on risk prioritization process based on stakeholder risk tolerance and other relevant criteria, in order to optimize consensus regarding priorities.
Task 7	Provide risk-related recommendations to stakeholders regarding risk strategy and planning, risk process facilitation, risk reporting, and specialized risk tasks by using effective communication techniques in order to support effective risk-based decision making.
Task 8	Promote risk ownership by proactively communicating roles and responsibilities and engaging project team members in the development of risk responses in order to improve risk response execution.
Task 9	Liaise with stakeholders of other projects by using effective communication techniques and sharing information on project risk performance in order to inform them of implications for their projects.

LESSON6. Perform Qualitative Risk Analysis
6.1 INTRODUCTIN

What is Perform Qualitative Risk Analysis?

It is the process of **prioritizing** risks for further analysis or action by **assessing** and **combining** their **probability** of occurrence and **impact**.

The key benefit of this process.

Enables the project managers to **reduce the level of uncertainty** and to focus on **high-priority risks.**

LESSON6. Perform Qualitative Risk Analysis
6.1 INTRODUCTIN

- Qualitative risk analysis are applied to the **list of risks created or updated by the Identify Risks process** to provide project management with the **characteristics** of the risks that have the **most influence** (**positive or negative**) on achieving the project's objectives.

- Perform Qualitative Risk Analysis is a **rapid and cost-effective** means of establishing priorities for
  - Plan Risk Responses .
  - laying the foundation of Perform Quantitative Risk Analysis, if required.
- The Perform Qualitative Risk Analysis process is **performed regularly throughout the project life cycle**, as defined in the **project's risk management plan.**

- This process can lead into Perform Quantitative Risk Analysis if required or directly into Plan Risk Responses

LESSON6. Perform Qualitative Risk Analysis
6.2 Purpose and Objectives

- **Assess and evaluate** the **probability** and the **effect** of each individual risk on the project objectives **based on agreed-upon characteristics** , **reflect the risk attitude** of the project team and other stakeholders

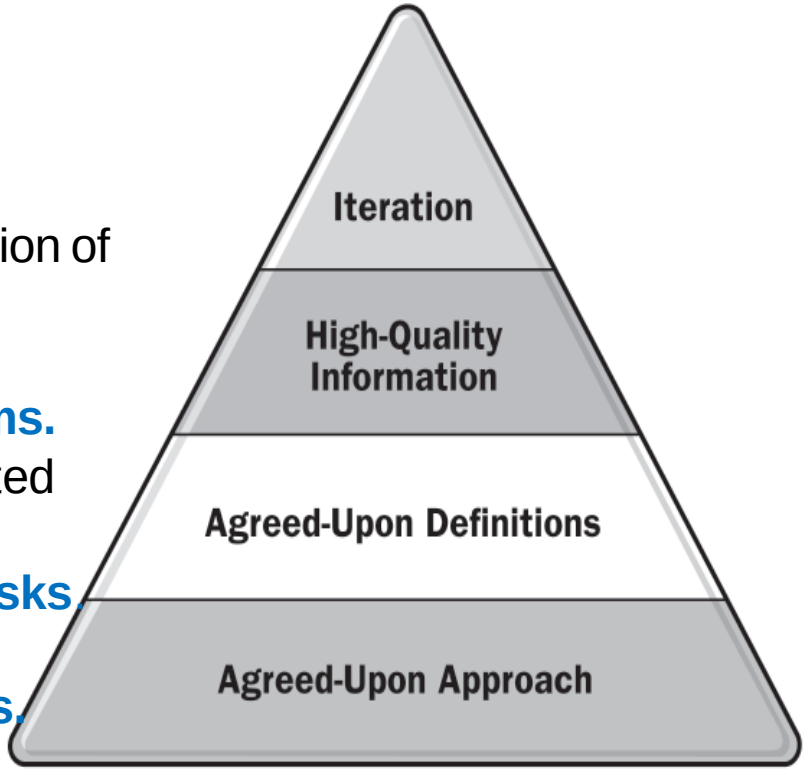
- **Prioritize risks by:**
  - **Probability.**
  - **Impact,**
  - **Urgency.**
  - **Organization's risk tolerance associated with the constraints of cost, schedule, scope, and quality.**
  - **And others**

- **Categorize risks according to their sources, root causes or affected areas.**
  - If several risks arise from a common source, called **a root cause**, risk **responses** may be **more effective when they focus on addressing this root cause.**
  - Identifying **common effects** from groups of risks allows identification of the **areas of greatest risk exposure** (e.g. to the project completion date, the budget, or scope), facilitating **risk response focus in these areas.**

LESSON6. Perform Qualitative Risk Analysis
6.3 Critical Success Factors

Agreement of the project stakeholders is a fundamental criterion and a common theme.

- **Use Agreed-Upon Approach** is the foundation of process **credibility.**
- **Use Agreed-Upon Definitions of Risk Terms.** enable **high-quality** information to be collected
- **Collect High-Quality Information about Risks.**
- **Perform Iterative Qualitative Risk Analysis.**



Finally, **with these conditions**, the process can be **executed reliably**, which contributes to the **credibility of its outputs**.

LESSON6. Perform Qualitative Risk Analysis
6.3 Critical Success Factors

1- Use Agreed-Upon Approach

The process is based on an agreed-upon approach to the assessment that is applied across all of the identified risks in any project.

The considered factors in determining the importance of a risk as follows:

1. **Probability (Likelihood)** of occurrence.

2. **Impact (Consequence)** on individual objectives if the risk occur.

3. **Urgency (proximity)(Closer):**
   Risks requiring near term responses may be considered **more urgent to address.**
   - ❖ Indicators of urgency can include:-
     - Lead time necessary to execute a risk response.
     - Clarity of symptoms and warning signs (delectability) may trigger the response.

LESSON6. Perform Qualitative Risk Analysis
6.3 Critical Success Factors

1- Use Agreed-Upon Approach - contd

4. Manageability. (manage the occurrence and impact)

Some risks are not manageable would be a **waste of resources address** them. The project team may examine these and decide to:

- **Go forward**, perhaps establishing a contingency reserve.
- **Stop or re-scope** the project because these risks.
- **Inform the customer** of the risks and ask for a decision from their point of view.

5. Impact external to the project.

A risk may increase in importance if it affects the enterprise beyond the project.

LESSON6. Perform Qualitative Risk Analysis
6.3 Critical Success Factors

2- Use Agreed-Upon Definitions of Risk Terms

- Risk assessment based on agreed-upon definitions of important terms.
- Definitions should be used consistently when assessing each risk.
- The definitions assists the providers of the information in giving realistic assessments for each risk.
- Facilitates the communication of the results to management and other stakeholders.

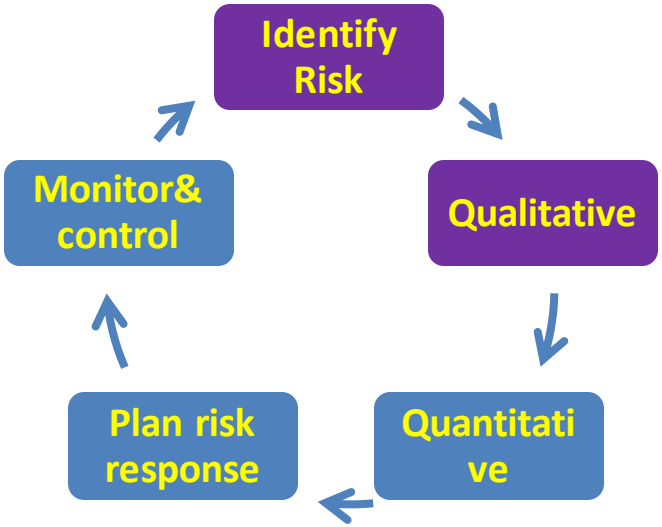
SCALE	PROBABILITY	± IMPACT ON PROJECT OBJECTIVES		
		TIME	COST	QUALITY
VHI	61-99%	>40 days	>$200K	Very significant impact on overall functionality
HI	41-60%	21-40 days	$101K-$200K	Significant impact on overall functionality
MED	21-40%	11-20 days	$51K-$100K	Some impact in key functional areas
LO	11-20%	6-10 days	$11K-$50K	Minor impact on overall functionality
VLO	1-10%	1-5 day	$1K-$10K	Minor impact on secondary functions
NIL	<1%	No change	No change	No change in functionality

3- Collect High-Quality Information about Risks

- Collection of high-quality information about risks is required.
- This information is not available in any historic database.
- Gathered by interviews, workshops, and other means using expert judgment.
- Data gathered from individuals may be subject to bias.
- Bias should be identified and addressed where possible, or a different, unbiased source of information should be found and used.

4- Perform Iterative Qualitative Risk Analysis

- The success of qualitative risk analysis is enhanced if the process is used periodically throughout the project.
- It is impossible to know in advance all the risks that may occur in a project, therefore the Identify Risks and Perform Qualitative Analysis processes should be repeated periodically for individual risks.
- The frequency of this effort will be planned in the Plan Risk Management process, but may also depend on events within the project itself.



Question

Question

You work as a project manager for KSK Inc. You are in the Perform Qualitative risk analysis with your project team. Which one of the following does indicate that the risk is closer to occur?

A. Probability.
B. Impact.
C. Manageability
D. Proximity

Correct answer is D:
Urgency (proximity)(Closer):
Risks requiring near term responses may be considered more urgent to address.

Question

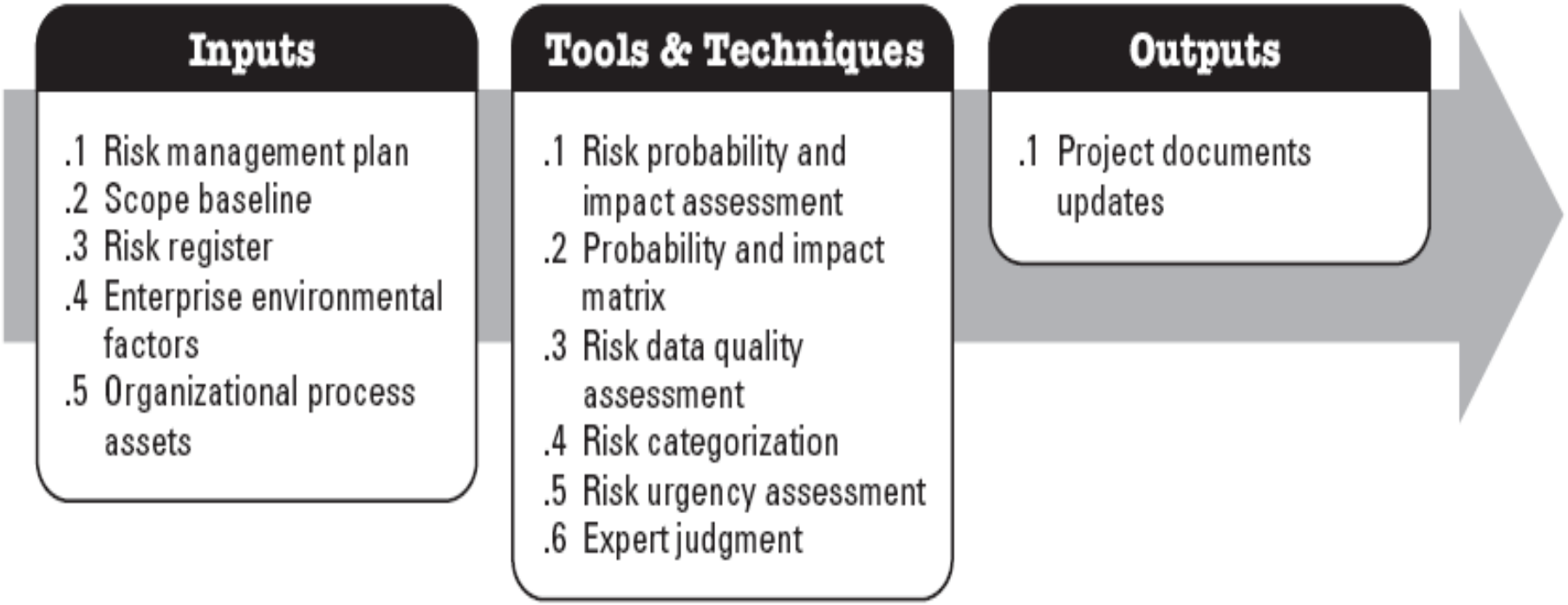
You are work as a project manager for MAK Inc. Now you are in the Perform Qualitative risk analysis with your project team. Which one of the following is a factor of risk prioritization in addition to the factors which are used in probability and impact matrix?

A. Probability.
B. Impact.
C. Manageability
D. importance

Correct answer is C:
Many factors can be used in risk prioritization. Probability , impact, urgency, manageability and impact external to the project and others.

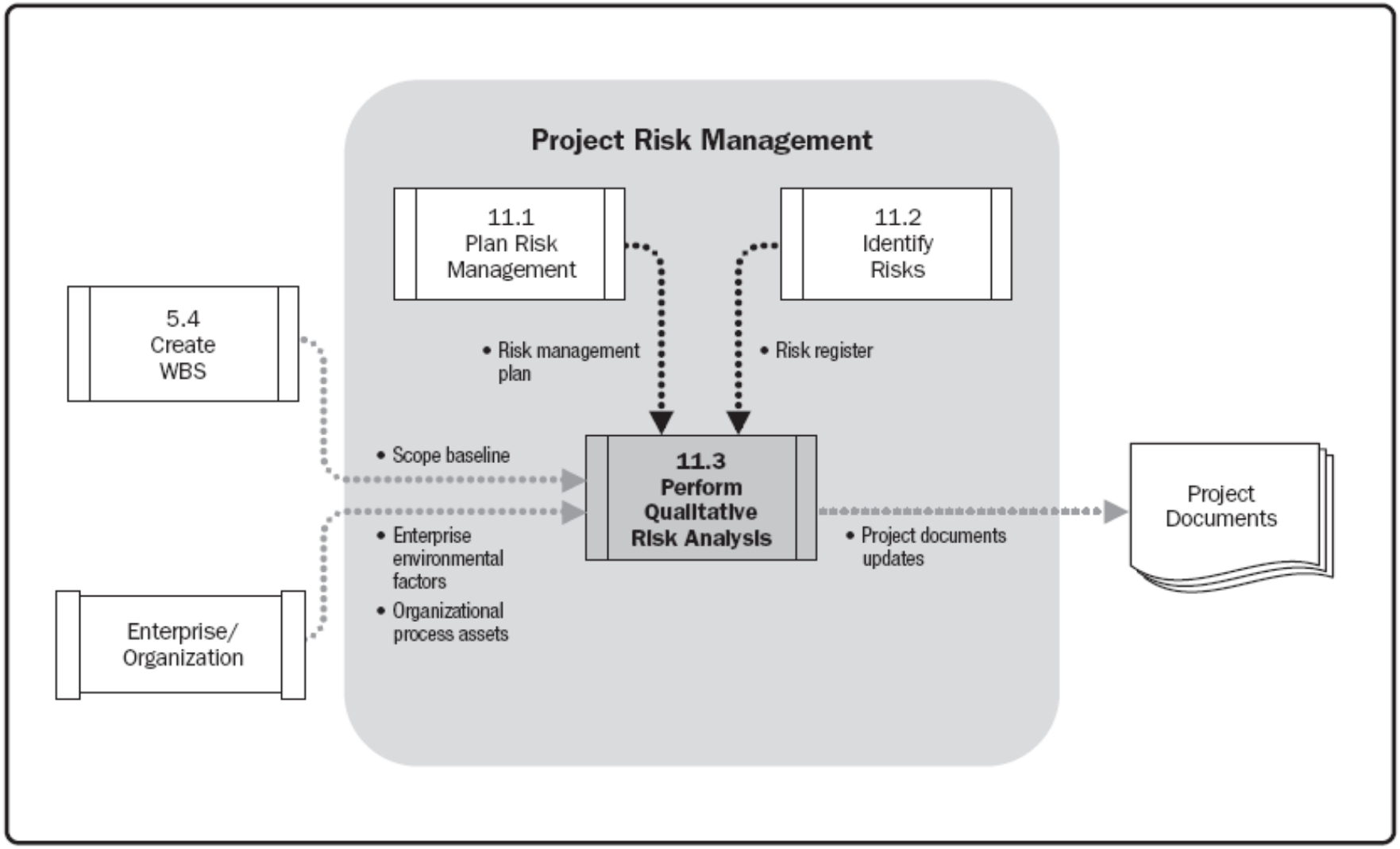
LESSON6. Perform Qualitative Risk Analysis
6.4 Inputs, Tools & Techniques, and Outputs

Inputs, Tools & Techniques, and Outputs



LESSON6. Perform Qualitative Risk Analysis
6.4 Inputs, Tools & Techniques, and Outputs

Perform Qualitative Risk Analysis Data Flow Diagram



LESSON6. Perform Qualitative Risk Analysis
6.4.1 Inputs

1- Risk Management Plan

Risk Management Plan includes	
1- Methodology	6- Definitions of risk probability& impact
2- Roles and responsibilities.	7- Probability and Impact Matrix
3- Budgeting	8- Revised stakeholders' tolerances
4- Timing.	9- Reporting formats
5- Risk categories	10- Tracking
And others	

These inputs are usually tailored to the project during the Plan Risk Management process. If they are not available, they may be developed during the Perform Qualitative Risk Analysis process.

LESSON6. Perform Qualitative Risk Analysis
6.4.1 Inputs

2- Scope Baseline

- Projects of a common or recurrent type tend to have more well-understood risks.
- Projects using state-of-the-art or first-of-its-kind technology, and highly complex projects, tend to have more uncertainty. This can be evaluated by examining the scope baseline.

LESSON6. Perform Qualitative Risk Analysis
6.4.1 Inputs

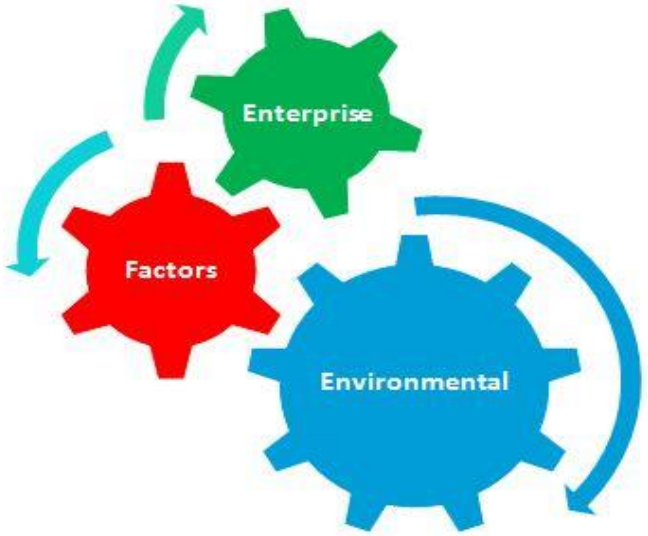
3- Risk Register

The risk register contains the information that will be used to assess and prioritize risks.

Risk Identification				Risk Response	
Risk describtion	Causes	Effects	ROOT Cause	Potential Risk Response	Nominated Risk Owner

LESSON6. Perform Qualitative Risk Analysis
6.4.1 Inputs

4- Enterprise Environmental Factors



5- Organizational Process Assets

LESSON6. Perform Qualitative Risk Analysis
6.4.2 Tools and Techniques

1- Risk Probability and Impact Assessment

- **Risk probability assessment** investigates the **likelihood** that each specific risk will occur.
- **Risk impact assessment** investigates the **potential effect** on a project objective such as **schedule, cost, quality, or performance**, including both **negative** effects for threats and **positive** effects for opportunities.
- **Probability and impact** are assessed for **each identified risks**.
- **Risks can be assessed in interviews or meetings:**
  with participants selected for their familiarity with the risk categories on the agenda.

❖ **Attendances:**
- Project team members.
- Knowledgeable persons external to the project.

LESSON6. Perform Qualitative Risk Analysis
6.4.2 Tools and Techniques

1- Risk Probability and Impact Assessment

In the assessment meetings or interviews :

- The level of probability for each risk and its impact on each objective is evaluated.
- Explanatory detail, including assumptions justifying the levels assigned, are recorded.
- Risk probabilities and impacts are rated according to the definitions given in the risk management plan.
- Risks with low ratings of probability and impact will be included within the risk register as part of the watch list for future monitoring.

LESSON6. Perform Qualitative Risk Analysis
6.4.2 Tools and Techniques

1- Risk Probability and Impact Assessment

SCALE	PROBABILITY	± IMPACT ON PROJECT OBJECTIVES		
		TIME	COST	QUALITY
VHI	61-99%	>40 days	>$200K	Very significant impact on overall functionality
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NIL	<1%	No change	No change	No change in functionality

The common way to assign levels of risk probability by ranges of probability, the subject matter experts only need to assess a risk's probability within a range rather than as a specific value.

LESSON6. Perform Qualitative Risk Analysis
6.4.2 Tools and Techniques

1- Risk Probability and Impact Assessment

Impact level definitions are very project-specific.

- Levels are defined by the organization as causing the same amount of pain or gain to the project for each level across objectives.
- If the impact is uncertain and could be assigned to more than one level of impact (e.g. from moderate to high) the analyst may choose to
  - Assign the risk to the impact level that represents the expected or average impact.
  - Extra analysis to reduce the range of uncertainty to fit within a single range.
- Definitions should be tailored or scaled by stakeholders to the specific project to be used for opportunities and threats.

LESSON6. Perform Qualitative Risk Analysis
6.4.2 Tools and Techniques

1- Risk Probability and Impact Assessment

Technique	Strengths	Weaknesses	CSFs
Estimating techniques (applied to probability and impacts)	• Addresses both key dimensions of a risk, namely its degree of uncertainty (expressed as probability) and its effect on project objectives (expressed as impact)	• Difficult to calibrate if there is no historical database of similar events • Terms for probability (e.g. probable, almost certain) and for impact (e.g. insignificant, major) are ambiguous and subjective • Impacts can be uncertain or represented by a range of values that cannot be put into a specific impact level such as "moderate impact on time"	• Agreed definitions of probability and impacts which reflect stakeholders' risk tolerances and thresholds • Values used in the definitions represent the same level of impact across objectives as perceived by the organization's management or project stakeholders • Consistent use of these definitions across all identified risks • Access to SMEs who have experience with the type of risk

LESSON6. Perform Qualitative Risk Analysis
6.4.2 Tools and Techniques

2- Probability and Impact Matrix

- Risks can be prioritized for further quantitative analysis and planning risk responses **based on their risk rating**.
- **Ratings** are assigned to risks based on their assessed **probability and impact**.
- Evaluation of each risk's importance and priority conducted using a **look-up table** or a **probability and impact matrix** by combinations of probability and impact that lead to **rating** the risks as **low, moderate, or high priority.**
- **Descriptive terms or numeric values** can be used depending on organizational .

Probability and Impact Matrix

Probability	Threats					Opportunities				
0.90	0.05	0.09	0.18	0.36	0.72	0.72	0.36	0.18	0.09	0.05
0.70	0.04	0.07	0.14	0.28	0.56	0.56	0.28	0.14	0.07	0.04
0.50	0.03	0.05	0.10	0.20	0.40	0.40	0.20	0.10	0.05	0.03
0.30	0.02	0.03	0.06	0.12	0.24	0.24	0.12	0.06	0.03	0.02
0.10	0.01	0.01	0.02	0.04	0.08	0.08	0.04	0.02	0.01	0.01
	0.05/ Very Low	0.10/ Low	0.20/ Moderate	0.40/ High	0.80/ Very High	0.80/ Very High	0.40/ High	0.20/ Moderate	0.10/ Low	0.05/ Very Low

Impact (numerical scale) on an objective (e.g., cost, time, scope or quality)

Each risk is rated on its probability of occurring and impact on an objective if it does occur. The organization's thresholds for low, moderate or high risks are shown in the matrix and determine whether the risk is scored as high, moderate or low for that objective.

LESSON6. Perform Qualitative Risk Analysis
6.4.2 Tools and Techniques

2- Probability and Impact Matrix

Probability and Impact Risk Ranking											
Probability	**Threats**					**Opportunities**					**Probability**
VHI	L	M	M	H	H	H	H	M	M	L	VHI
HI	L	L	M	H	H	H	H	M	L	L	HI
MOD	L	L	M	H	H	H	H	M	L	L	MOD
LOW	L	L	L	M	H	H	M	L	L	L	LOW
VLOW	L	L	L	L	M	M	L	L	L	L	VLOW
	VLOW	LOW	MOD	HI	VHI	VHI	HI	MOD	LOW	VLOW	
	Impact (Threats)					**Impact (Opportunities)**					

LESSON6. Perform Qualitative Risk Analysis
6.4.2 Tools and Techniques

2- Probability and Impact Matrix

- The organization classify the risk-rating to high risk, moderate risk, and low risk.
- Usually, these risk-rating rules are specified by the organization in advance of the project and included in organizational process assets.
- Risk rating rules can be tailored in the Plan Risk Management process to the specific project.
- The organization can rate a risk separately for each objective (e.g., cost, time, and scope).
- May develop ways to determine one overall rating for each risk.
- Opportunities and threats are handled in the same matrix using definitions of the different levels of impact that are appropriate for each.
- The risk score helps guide risk responses.

LESSON6. Perform Qualitative Risk Analysis
6.4.2 Tools and Techniques

2- Probability and Impact Matrix

- Risks that have a negative impact on objectives, known as threats if they occur, and that are in the **high-risk (dark gray)** zone of the matrix, may require priority action and aggressive response strategies.
- **Threats** found in the **low-risk** (**medium gray**) zone may not require proactive management action beyond being placed in the risk register as part of the watch list or adding a contingency reserve.
- Similarly for **opportunities**, those in the **high-risk (dark gray)** zone, which may be obtained most easily and offer the greatest benefit, should be targeted first.
- Opportunities in the **low-risk (medium gray)** zone should be monitored.

Probability and Impact Matrix

Probability	Threats					Opportunities				
0.90	0.05	0.09	0.18	0.36	0.72	0.72	0.36	0.18	0.09	0.05
0.70	0.04	0.07	0.14	0.28	0.56	0.56	0.28	0.14	0.07	0.04
0.50	0.03	0.05	0.10	0.20	0.40	0.40	0.20	0.10	0.05	0.03
0.30	0.02	0.03	0.06	0.12	0.24	0.24	0.12	0.06	0.03	0.02
0.10	0.01	0.01	0.02	0.04	0.08	0.08	0.04	0.02	0.01	0.01
	0.05/ Very Low	0.10/ Low	0.20/ Moderate	0.40/ High	0.80/ Very High	0.80/ Very High	0.40/ High	0.20/ Moderate	0.10/ Low	0.05/ Very Low

Impact (numerical scale) on an objective (e.g., cost, time, scope or quality)

Each risk is rated on its probability of occurring and impact on an objective if it does occur. The organization's thresholds for low, moderate or high risks are shown in the matrix and determine whether the risk is scored as high, moderate or low for that objective.

LESSON6. Perform Qualitative Risk Analysis
6.4.2 Tools and Techniques

2- Probability and Impact Matrix

Technique	Strengths	Weaknesses	CSFs
Probability and Impact Matrix (P-I Matrix)	• Allows the organization to prioritize the project risks for further analysis (e.g., quantitative) or risk response • Reflects the organization's level of risk tolerance	• Does not explicitly handle other factors such as urgency or manageability that may partly determine a risk's ranking. • The range of uncertainty in the assessment of a risk's probability or impact may overlap a boundary	• P×I matrix requires that the input data are clear and unambiguous in assigning levels of probability and impact • Effective estimation of impact and likelihood as outlined previously • Organizations should be careful to assess the combinations of probability and impact that qualify a risk as low, moderate or high risk so that the method used reflects the organization's risk attitude

LESSON6. Perform Qualitative Risk Analysis
6.4.2 Tools and Techniques

2- Probability and Impact Matrix

Technique	Strengths	Weaknesses	CSFs
			• Definitions used to designate the levels of impact (L, M, H) for each objective should represent the same level of impact as perceived by the organization's management or project stakeholders as reflecting the organization's utility function

Question

You work as a project manager for Doca Desta Inc. You are in the Perform Qualitative risk analysis with your project team. Which one of the following risk has the highest priority in the project?

A. R1
B. R2
C. R4
D. R5

Risk	Probability	Impact
R1	Very high	Moderate
R2	Very high	Low
R3	High	High
R4	Moderate	High
R5	Very high	High

Correct answer is D:
From the table it's clear that R5 has very high probability and high impact, according to Pxl Matrix pmbok 5 page 330.

Question

You work as a project manager for KKA Inc. You are in the Perform Qualitative risk analysis with your project team. Which one of the following risk has the lowest priority in the project?

A. R1
B. R2
C. R4
D. R3

Risk	Probability	Impact
R1	Very high	Moderate
R2	Very high	Low
R3	High	High
R4	Moderate	High
R5	Very high	High

Correct answer is B: is the lowest priority.
From the table it's clear that R2 has a very high probability and Low impact, according to Pxl Matrix pmbok 5 page 330.

Question

You work as a project manager for KKA Inc. You are in the Perform Qualitative risk analysis with your project team. Which one of the following risk has the highest priority in the project?

A. R1
B. R2
C. R4
D. R5

Risk	Probability	Impact
R1	High	Very high
R2	Very high	Low
R3	High	High
R4	Moderate	High
R5	Very high	High

Correct answer is A:
By combining P x I from the table. R1 and R5 have the same priority. But the impact is more important than probability so the right answer is R1 according to PxI Matrix pmbok5 page# 330.

LESSON6. Perform Qualitative Risk Analysis
6.4.2 Tools and Techniques

3- Risk Data Quality Assessment

- Evaluate the degree to which the data about risks is useful for risk management.
- Examining the degree to which the risk is understood and the accuracy, quality, reliability, and integrity of the data about the risk.
- The use of low-quality risk data may lead to a qualitative risk analysis of little use to the project.
- If data quality is unacceptable, it may be necessary to gather better data.
- Collection of information about risks is difficult, and consumes more time and resources than originally planned.

LESSON6. Perform Qualitative Risk Analysis
6.4.2 Tools and Techniques

4- Risk Categorization

Risks to the project can be categorized by

- ❑ Sources of risk (e.g., using the RBS).
- ❑ The area of the project affected (e.g., using the WBS).
- ❑ The areas of the project most exposed to the effects of uncertainty (e.g., project phase)
- ❑ Common root causes.

This technique helps determine work packages, activities, project phases or even roles in the project, which can lead to the development of effective risk responses.

LESSON6. Perform Qualitative Risk Analysis
6.4.2 Tools and Techniques

5- Risk Urgency Assessment

- Risks requiring near-term responses may be considered more urgent to address.

- Indicators of priority may include
  - Probability of detecting the risk(delectability).
  - Time to affect a risk response.
  - Symptoms and warning signs
  - Risk rating.
  - Manageability.
  - Impact external to the project.
  - Stakeholder tolerance.

- In some qualitative analyses, the assessment of risk urgency is **combined** with the risk ranking that is determined from the probability and impact matrix to give a final **risk severity rating.**

LESSON6. Perform Qualitative Risk Analysis
6.4.2 Tools and Techniques

6- Expert Judgment

- Expert judgment is required to assess the probability and impact of each risk to determine its location in the matrix .
- Experts generally are those having experience with similar, recent projects.
- Using expert judgment is often in facilitation workshops or interviews.
- The experts' bias should be taken into account in this process.

LESSON6. Perform Qualitative Risk Analysis
6.4.2 Tools and Techniques

7- Analytic Hierarchy Process (AHP)

- AHP is a method to calibrate preferences for achieving the different objectives of a project.
  - Do they prefer to achieve time more than cost?
  - Is quality more important than scope?
  - What is the relative weighting of the project's objectives in terms of their priority to the stakeholders or to management?
- The results are weights (summing to 100%) that reflect the relative priority of each objective.
- This prioritization can be important in determining how trade-offs affecting different objectives (e.g., Should we reduce scope to finish on time?) will be decided.
- It can also be used to create an overall project risk priority list from risks that have been assessed on their implications for individual objectives.
- Need specialized software to implement AHP.

LESSON6. Perform Qualitative Risk Analysis
6.4.2 Tools and Techniques

7- Analytic Hierarchy Process (AHP)

AHP spreadsheet

Preference Factors	
1	Equally Preferred
2	Mildly Preferred
3	Moderately Preferred
4	Greatly Preferred
5	Always Preferred

Input Matrix (Preference Factors)				
	Cost	Time	Scope	Quality
Cost	1.00	0.25	0.33	0.20
Time	4.00	1.00	1.00	0.25
Scope	3.00	1.00	1.00	0.25
Quality	5.00	4.00	4.00	1.00

Note: Preference Factors input into the Dark Gray Area. Principal Diagonal is 1.0 by definition.
Other cells calculated as 1 / preference factor for same objectives.

Calculated Factors (Preference Factor / Column Total)					Weighting Factors
	Cost	Time	Scope	Quality	Average of Row
Cost	0.08	0.04	0.05	0.12	0.1
Time	0.31	0.16	0.16	0.15	0.2
Scope	0.23	0.16	0.16	0.15	0.2
Quality	0.38	0.64	0.63	0.59	0.6
Sum	13.00	6.25	6.33	1.70	1.0

LESSON6. Perform Qualitative Risk Analysis
6.4.2 Tools and Techniques

7- Analytic Hierarchy Process (AHP)

Technique	Strengths	Weaknesses	CSFs
Analytic Hierarchy Process	• Assists in developing a relative weighting for project objectives that reflects the organization's priorities for time, cost, scope and quality for the project • Assists the creation of an overall project priority list of risks created from the risks' priority with respect to individual objectives	• Organizational decisions are often made by committees, and individuals may not agree on relative priority among objectives • Difficult to gather the information about pair-wise comparison of the objectives from high-level management	• Expert facilitator in the process • Agreement by management that it is useful to develop a consistent set of priorities among objectives • Use of proper method or available AHP software

8- Post-project reviews/Lessons Learned/Historical Information

9- Root-Cause Analysis

LESSON6. Perform Qualitative Risk Analysis
6.4.3 Outputs

1- Project Documents Updates

Project documents that may be updated include, but are not limited to:

1-1 Risk register updates.

As new information becomes available through the qualitative risk assessment, the risk register is updated. Updates to the risk register may include:-

Risk Identification						Qulitative process								
Risk describtion	Causes	Effects	ROOT Cause	Potential Risk Response	Nominated Risk Owner	Probability	Impact	Ranking or scores	urgency	Category	Risk in watch list	Need further analysis	Trend in qualitative risk	Need Response

LESSON6. Perform Qualitative Risk Analysis
6.4.3 Outputs

1- Project Documents Updates

1-2 Assumptions log updates.

- As new information becomes available through the qualitative risk assessment, assumptions could change.
- The assumptions log needs to be revisited to accommodate this new information.
- Assumptions may be incorporated into the project scope statement or in a separate assumptions log.

LESSON6. Perform Qualitative Risk Analysis

The Perform Qualitative Risk Analysis Process
is illustrated in this figure

LESSON6. Perform Qualitative Risk Analysis

1- Select Risk Characteristics that Define Risks' Importance

- Qualitative risk analysis tools provide ways to distinguish those risks that are important for response or further analysis from those that are less important.
- The criteria that make a risk of interest to management are agreed upon in advance and implemented in the tools used.
- Output from qualitative risk analysis tools includes a listing of risks in priority order or in priority groups (e.g., high, moderate, and low).
- The tools for qualitative risk analysis allow the organization or project stakeholders to specify those levels or combinations of risk characteristics that make a particular risk of interest to management.
- Most tools assess a risk's importance from a combination of probability of occurrence and impact on objectives.

LESSON6. Perform Qualitative Risk Analysis

2- Collect and Analyze Data

- Assessment of individual risks is based on information collected about them.
- Interviews, workshops, and references to databases of prior projects, require management support and attention.
- It is important to protect against bias in data gathering, which is important when relying on expert judgment for the information.

3- Prioritize Risks by Probability and Impact on Specific Objectives

- Some tools distinguishing a risk's priority in terms of the affected objective.
- Provides a list of risks that are important for any specific objective of interest to management.

4- Prioritize Risks by Probability and Impact on Overall Project

- For easy communication with management and other stakeholders, one list of prioritized risks for the entire project to be created as contrasted with its importance to specific objectives.
- The organization should be explicit about how that index is created.
  - Usually the index reflects the organization's preference among objectives.
- The technique for creating the overall risk priority measure should be documented in the Plan Risk Management process.

LESSON6. Perform Qualitative Risk Analysis

5- Categorize Risk Causes

- Understanding the **relationships between risks** may provide a better understanding of the **possibility and magnitude of project risk** than if risks are only considered as **separate and independent events.**

- **Identifying common root causes of a group of risks**, may reveal both the **magnitude of the risk event for the group as a whole** along with **effective strategies that might address several risks simultaneously.**

- **Some risks may be linked with others in a causal chain**, and understanding the **chain of risks** may lead to a better **understanding of the implication of risk for the project.**

- **Identifying risks that can occur at the same time** or using the same resources for recovery might provide a realistic picture **of problems of risk mitigation using scarce resources.**

- Combining the results of the Perform Qualitative Risk Analysis process with the **risk breakdown structure** can show **clusters of priority risks arising from specific sources.**

LESSON6. Perform Qualitative Risk Analysis

6- Document the Results of the Perform Qualitative Risk Analysis Process

Update the risk register

RISK REGISTER

Risk Identification						Qulitative process								
Risk describtion	Causes	Effects	ROOT Cause	Potential Risk Response	Nominated Risk Owner	Probability	Impact	Ranking or scores	urgency	Category	Risk in watch list	Need further analysis	Trend in qualitative risk	Need Response

Question

You are a project manager for a new project. Now you are working to complete the qualitative risk analysis for your project. During the analysis you encourage the project team to begin the grouping of identified risks by common causes. What is the primary advantage of grouping the risks by common causes?

A. It helps the project team realize the areas of the project most implicated by risks.
B. It saves time by collecting the related resources, such as project team members, to analyze the risk events.
C. It can lead to developing effective risk responses.
D. It can lead to the creation of risk categories unique to each project.

Correct answer is C:
Risk Categorization helps determine work packages, activities, project phases or even roles in the project, which can lead to the development of effective risk responses. PMBOK5 Page# 332

Question

During the process of performing qualitative risk analysis. All of the following updates will be included within the risk register updates except:

A. List of low priority risks.
B. Probability of achieving time objectives.
C. Risks grouped by categories.
D. List of risks need additional analysis.

Correct answer is B:
Probability of achieving time objectives is included during quantitative risk analysis.

RMP COACH

PROJECT RISK MANAGEMENT Course

PMI-RMP

LESSON 7
Perform Quantitative Risk Analysis

Engr. ALAA SULTAN
Senior Project Manager
PgMP, PMP, PMI-RMP, OCP, 6SIGMA

PROJECT RISK MANAGEMENT PMI-RMP

Exam Content Outline

Domain 5: Perform Specialized Risk Analyses

Activities related to the specialized quantitative and qualitative tools and techniques used by project risk management professionals.

Tasks	Perform Specialized Risk Analyses (14–16%)
Task 1	Evaluate the attributes of identified risks using advanced quantitative tools and specialized qualitative techniques in order to estimate overall risk exposure of the project.
Task 2	Analyze risk data produced during the project using statistical analyses and expert judgment in order to determine strengths and weaknesses of risk strategy and processes and recommend process improvements when indicated.
Task 3	Perform specialized risk analysis using advanced tools and techniques in order to support stakeholder decision making for the project.

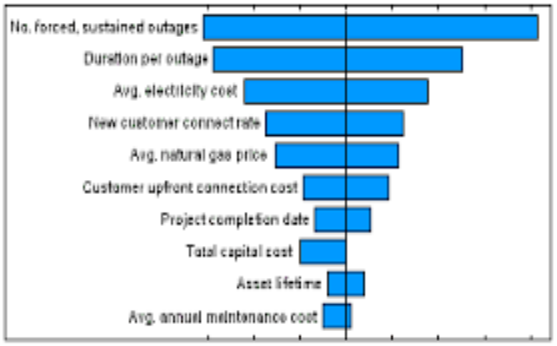
LESSON7. Perform Quantitative Risk Analysis
7.1 Introduction

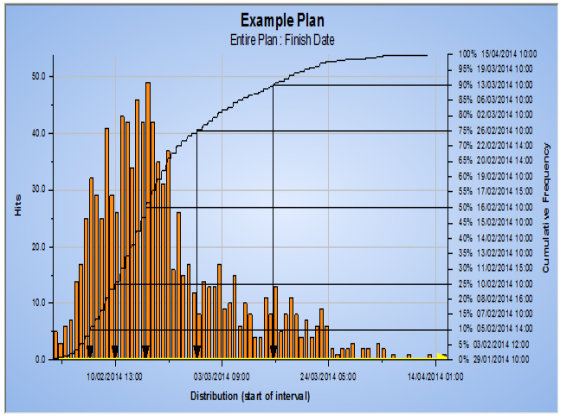
- **Perform Quantitative Risk Analysis** is the process of numerically analyzing the effect of identified risks on overall project objectives, when considering risks simultaneously

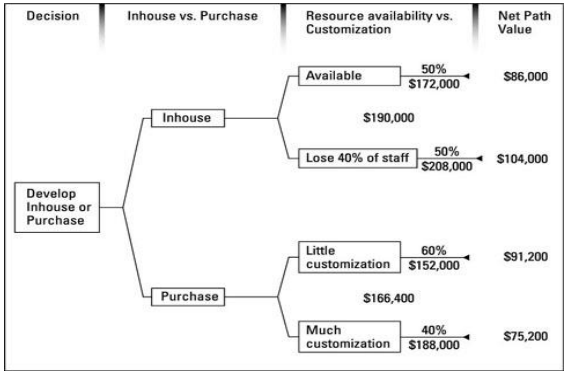
- **The key benefit** of this process is that it produces quantitative risk information to support decision making in order to reduce project uncertainty.

- Used mostly to evaluate the aggregate effect of all risks affecting the project.

- When the risks drive the quantitative analysis, the process may be used to assign a numerical priority rating to those risks individually.

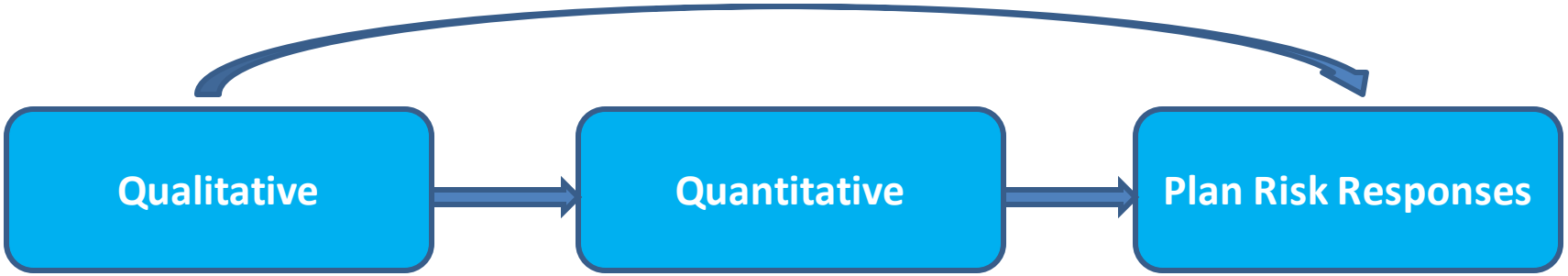






LESSON7. Perform Quantitative Risk Analysis
7.1 Introduction

- Quantitative Analysis follows Qualitative Risk Analysis process.
- **In some cases Quantitative Analysis are bypassed:**
  - lack of sufficient data to develop appropriate models.
  - Qualitative analysis provide enough information for development of effective risk responses, especially for smaller projects.
  - No need for or no viability of quantitative risk analysis.
  - Unavailability of time and budget.



LESSON7. Perform Quantitative Risk Analysis
7.1 Introduction

- The project manager should exercise expert judgment to determine the need for and the viability of quantitative risk analysis.
- During the Plan Risk Management process, the benefits of quantitative risk analysis should be weighted against the effort required to ensure that the additional insights and value justify the additional effort.
- The availability of time and budget, and the need for qualitative or quantitative statements about risk and impacts, will determine which method(s) to use on any particular project.
- Quantitative Analysis should be repeated, as needed, as part of the Control Risks process to determine if the overall project risk has been satisfactorily decreased.
- Trends may indicate the need for more or less focus on appropriate risk . management activities.

LESSON7. Perform Quantitative Risk Analysis
7.1 Introduction

- Qualitative risk analysis is prioritizing individual risks viewed one at a time, therefore cannot produce measures of overall project risk when all risks are considered simultaneously.
- Specific project risks are usually best understood and quantified at a **detailed level** such as the line-item cost or schedule activity level.
- By contrast, project objectives such as achievement of the project's budget or the schedule are specified at a **higher level**, often at the level of the total project.
- An overall risk analysis, by quantitative techniques, estimates the implication of all quantified risks on project objectives.

LESSON7. Perform Quantitative Risk Analysis
7.1 Introduction

The implementation of overall risk analysis using quantitative methods requires:

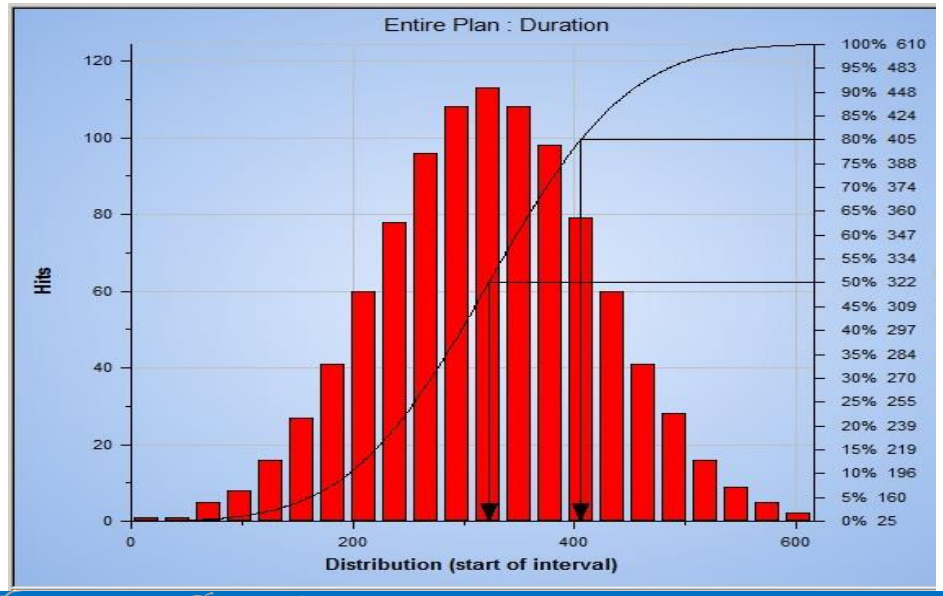
- Complete and accurate representation of the project objectives built up from individual project elements (project schedule or cost estimate).
- Identifying risks on individual project elements such as schedule activities or line-item costs at a level of detail that lends itself to specific assessment of individual risks.
- Including generic risks that have a broader effect than individual project elements.
- Applying a quantitative method (such as Monte Carlo simulation or decision tree analysis) that incorporates multiple risks simultaneously in determining overall impact on the overall project objective.

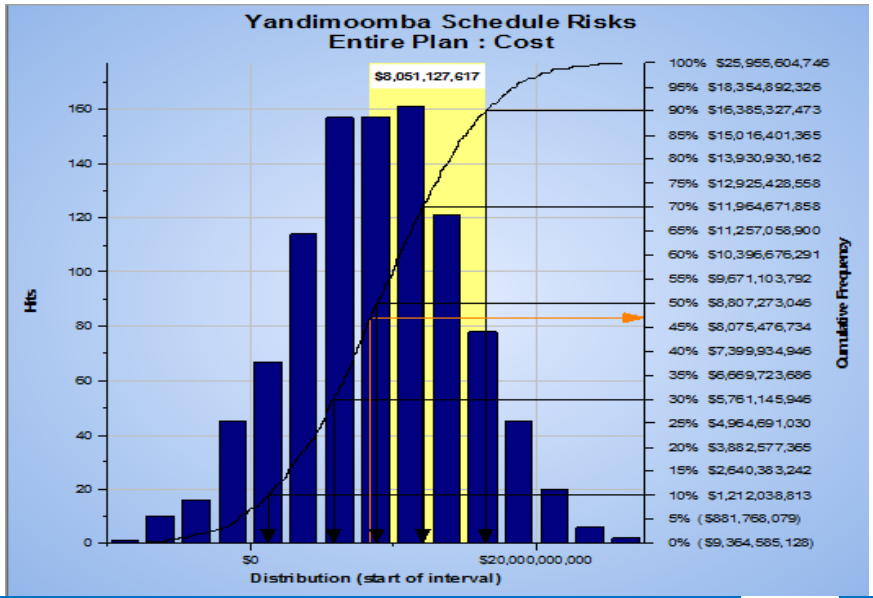
LESSON7. Perform Quantitative Risk Analysis
7.1 Introduction

- Results from this analysis evaluate :

  • likelihood of success in achieving project objectives and to estimate (time and cost) .
  • Contingency reserves.

- Usually for time and cost objectives because are appropriate to both the risks and the risk tolerance of project stakeholders.

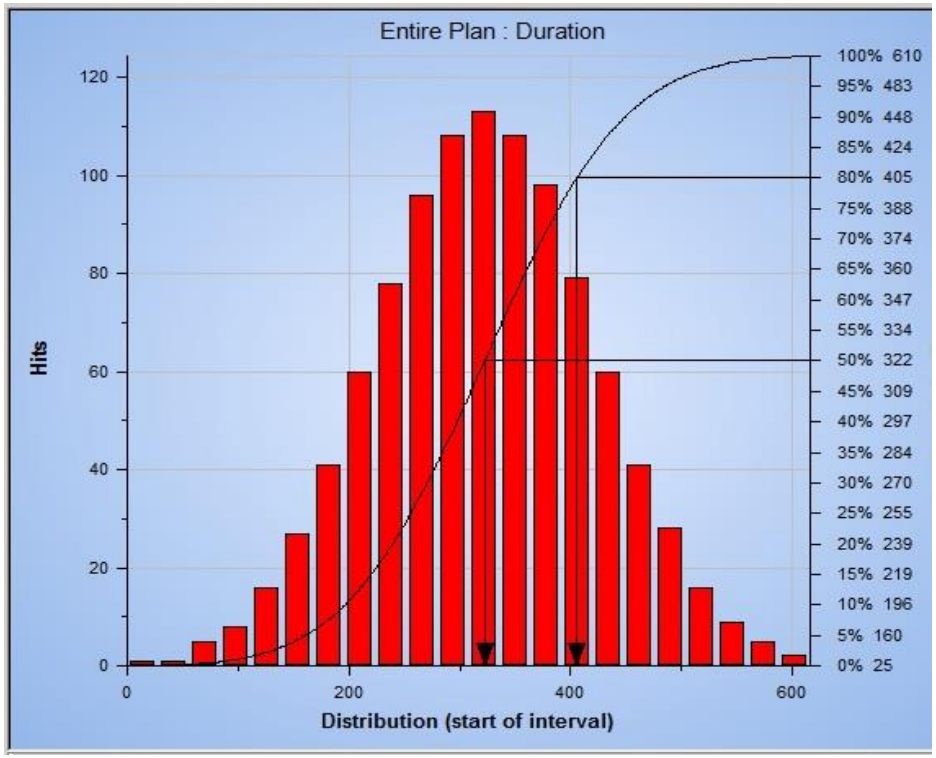




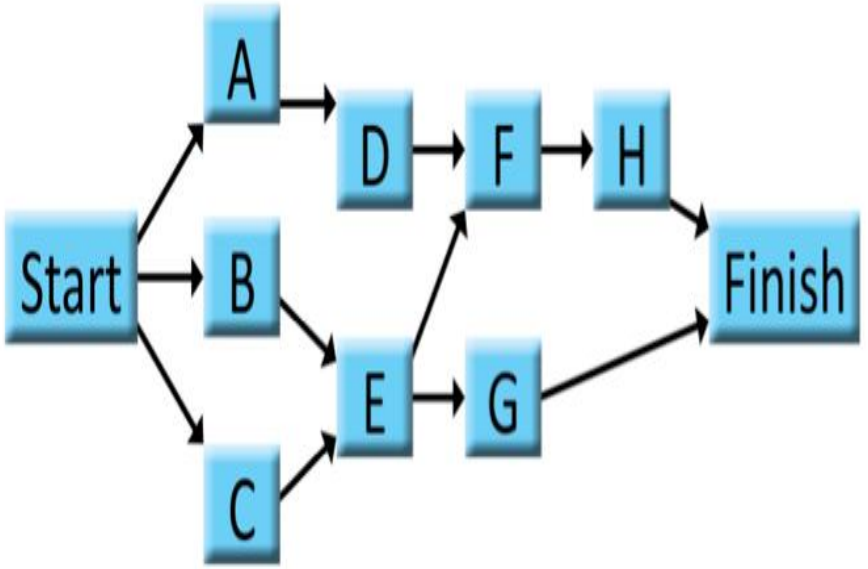
LESSON7. Perform Quantitative Risk Analysis
7.1 Introduction

Using quantitative techniques such as Monte Carlo simulation may provide more realism in the estimate of the overall project cost or schedule than a non-probabilistic approach which assumes that the activity durations or line-item cost estimates are deterministic

Probabilistic



Non-Probabilistic(deterministic)



LESSON7. Perform Quantitative Risk Analysis
7.1 Introduction

Results of the quantitative analysis will be compared to the project plan (baseline or current) to give management an estimate of the overall project risk

and will answer important questions such as:

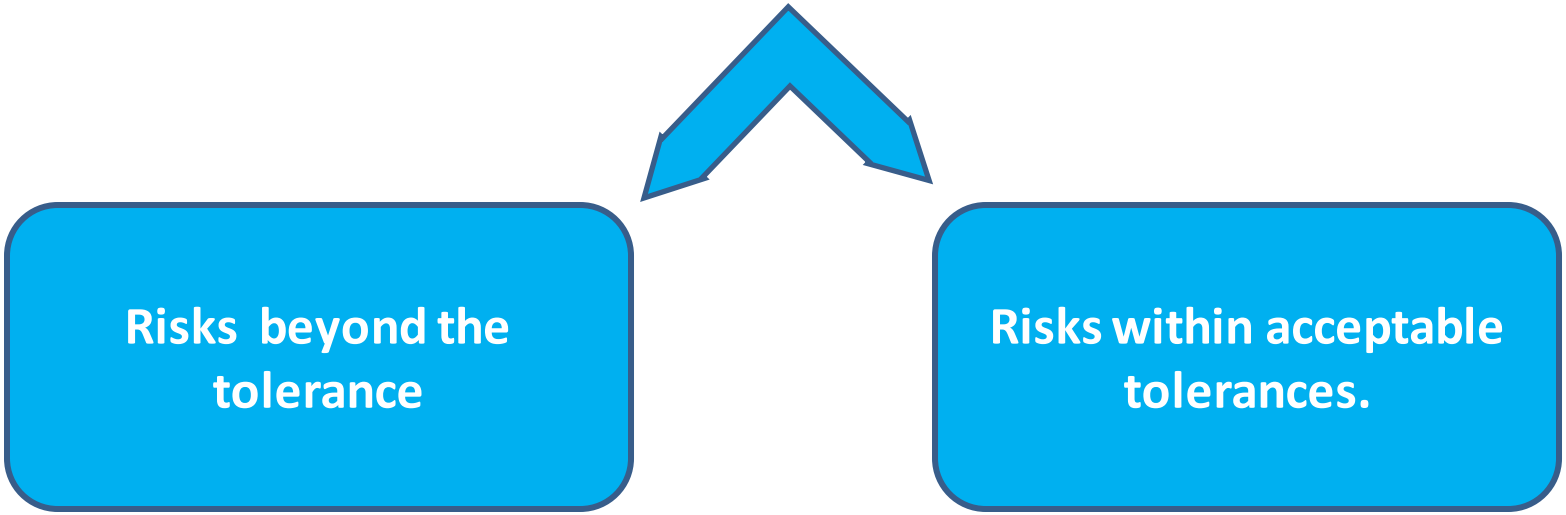
- What is the probability of meeting the project's objectives?
- How much contingency reserve (e.g., reserves or buffers of time, resources, and cost) is needed to the organization confidence level based upon its risk tolerance?
- What are those parts of the project, such as line-item costs or schedule activities, which contribute the most risk when all risks are considered simultaneously?
- Which individual risks contribute the most to overall project risk?

LESSON7. Perform Quantitative Risk Analysis
7.1 Introduction

Estimating overall project risk using quantitative methods helps distinguish between

- Risks beyond the tolerance of the stakeholders.
- Risks within acceptable tolerances.

Risks beyond the tolerance of the stakeholders need **vigorous risk responses** to protect the most important objectives to the stakeholders.



LESSON7. Perform Quantitative Risk Analysis
7.1 Introduction

A high-level comparison of quantitative and qualitative risk analysis processes

Qualitative Risk Analysis

- Addresses individual risks descriptively
- Assesses the discrete probability of occurrence and impact on objectives if it does occur
- Prioritizes individual risks for subsequent treatment
- Adds to risk register
- Leads to quantitative risk analysis

Quantitative Risk Analysis

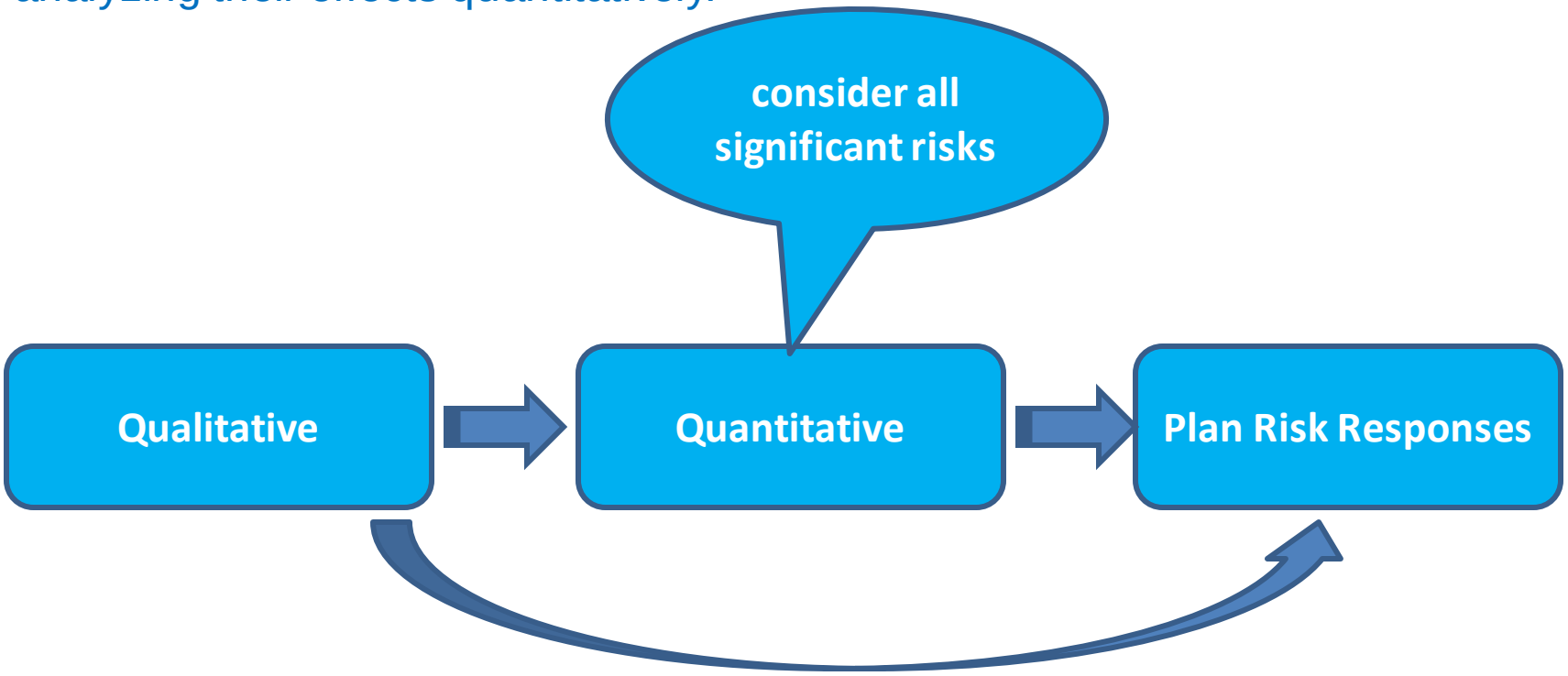
- Predicts likely project outcomes based on combined effects of risks
- Uses probability distributions to characterize the risk's probability and impact
- Uses project model (e.g. schedule, cost estimate)
- Uses a quantitative method, requires specialized tools
- Estimates likelihood of meeting targets and contingency needed to achieve desired level of comfort
- Identifies risks with greatest effect on overall project risk

LESSON7. Perform Quantitative Risk Analysis
7.2 Critical Success Factors

1- Prior Risk Identification and Qualitative Risk Analysis

- The Quantitative process after the Identify Risks and Qualitative processes have been completed.

- Reference to a prioritized list of identified risks ensures that the Perform Quantitative Risk Analysis process will consider all significant risks when analyzing their effects quantitatively.



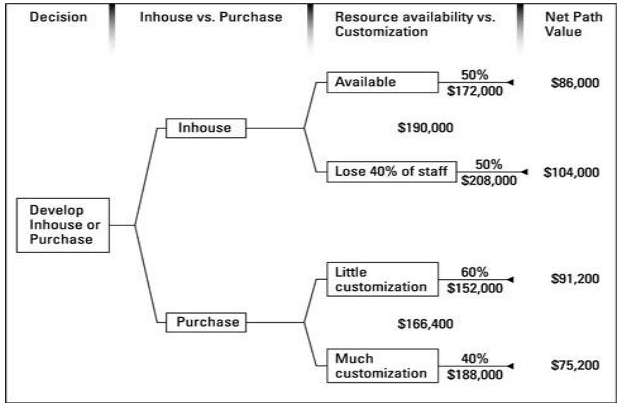
LESSON7. Perform Quantitative Risk Analysis
7.2 Critical Success Factors

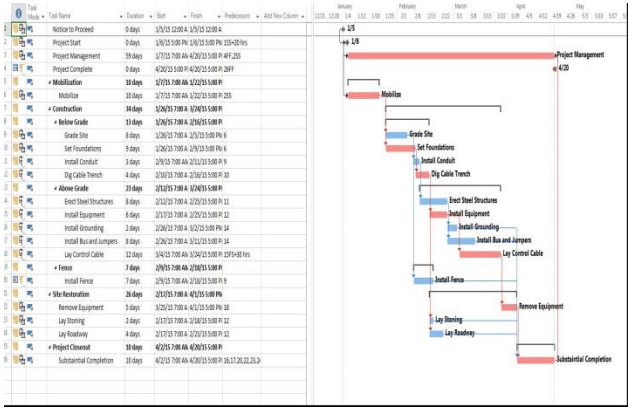
2- Appropriate Project Model

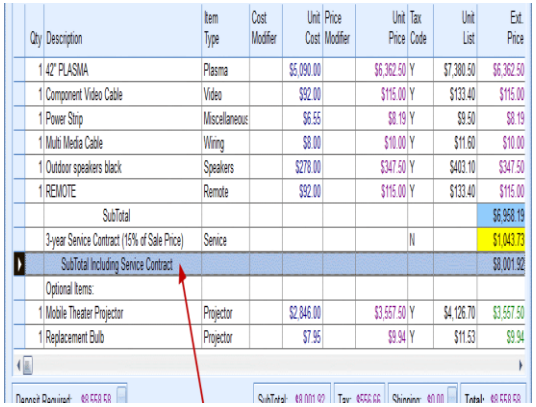
- An appropriate model of the project should be used as the basis for quantitative risk analysis.

- Project models most frequently used in quantitative risk analysis include:
  - Project schedule (for time).
  - line-item cost estimates (for cost).
  - Decision tree (for decisions in the face of uncertainty).
  - Other total-project models.

- Quantitative risk analysis is especially sensitive to the completeness and correctness of the model of the project that is used.






Qty
Description
Item Type
Cost Modifier
Unit Cost
Price Modifier
Unit Price
Tax Code
Unit List
Ext. Price
1 42" PLASMA Plasma $5,090.00 $6,362.50 Y $7,380.50 $6,362.50
1 Component Video Cable Video $92.00 $115.00 Y $133.40 $115.00
1 Power Strip Miscellaneous $6.55 $8.19 Y $9.50 $8.19
1 Multi Media Cable Wiring $8.00 $10.00 Y $11.60 $10.00
1 Outdoor speakers black Speakers $278.00 $347.50 Y $403.10 $347.50
1 REMOTE Remote $92.00 $115.00 Y $133.40 $115.00
SubTotal $6,958.19
3-year Service Contract (15% of Sale Price) Service N $1,043.73
SubTotal Including Service Contract $8,001.92
Optional Items:
1 Mobile Theater Projector Projector $2,846.00 $3,557.50 Y $4,126.70 $3,557.50
1 Replacement Bulb Projector $7.95 $9.94 Y $11.53 $9.94

3- Commitment to Collecting High-Quality Risk Data

- Often high-quality data about risks are not available in any historic database.
- Should be gathered by interviews, workshops, and other means using expert judgment.
- Collection of risk data requires resources and time as well as management support.

4- Unbiased Data

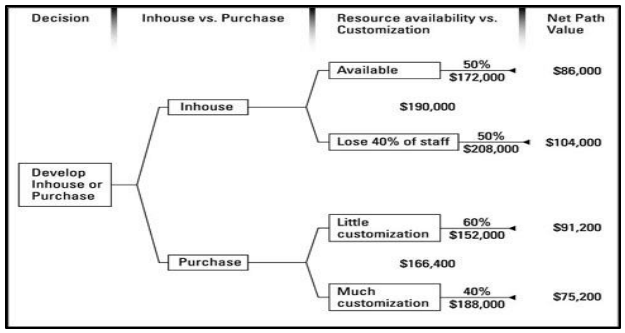
- Success in gathering data requires the ability to recognize when biases occur and should address that bias or developing other unbiased sources of the data.

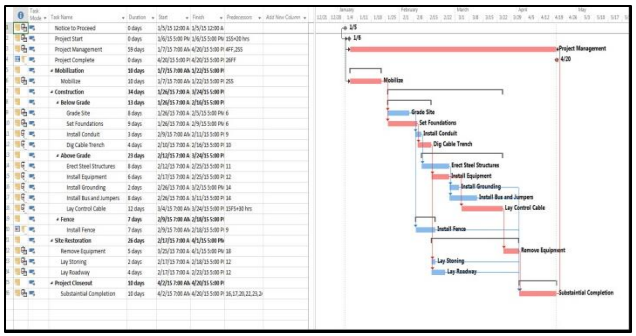
- Common sources of bias are **cognitive bias and motivational bias.**

LESSON7. Perform Quantitative Risk Analysis
7.2 Critical Success Factors

5- Overall Project Risk Derived from Individual Risks

- Overall project risk derives from the individual risks.
- Risk analysis of cost and schedule an appropriate method is Monte Carlo simulation.
- Decision tree is an appropriate method for making decisions when future events are not certain, using the probability and impact of all risks, and combining their effect to derive an overall project measure such as value or cost.
- In these methods, the risks are specified at the level of the detailed tasks or line-item costs and incorporated into the model of the project to calculate effects on objectives such as schedule or cost for the entire project, by combining those risks.





Qty	Description	Item Type	Cost Modifier	Unit Cost	Price Modifier	Unit Price	Tax Code	Unit List	Ext. Price
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1	Component Video Cable	Video		$92.00		$115.00	Y	$133.40	$115.00
1	Power Strip	Miscellaneous		$6.55		$8.19	Y	$9.50	$8.19
1	Multi Media Cable	Wiring		$8.00		$10.00	Y	$11.60	$10.00
1	Outdoor speakers black	Speakers		$278.00		$347.50	Y	$403.10	$347.50
1	REMOTE	Remote		$92.00		$115.00	Y	$133.40	$115.00
	SubTotal								$6,958.19
	3-year Service Contract (15% of Sale Price)	Senice					N		$1,043.73
	SubTotal Including Service Contract								$8,001.92
	Optional Items:								
1	Mobile Theater Projector	Projector		$2,845.00		$3,557.50	Y	$4,126.70	$3,557.50
1	Replacement Bulb	Projector		$7.95		$9.94	Y	$11.53	$9.94

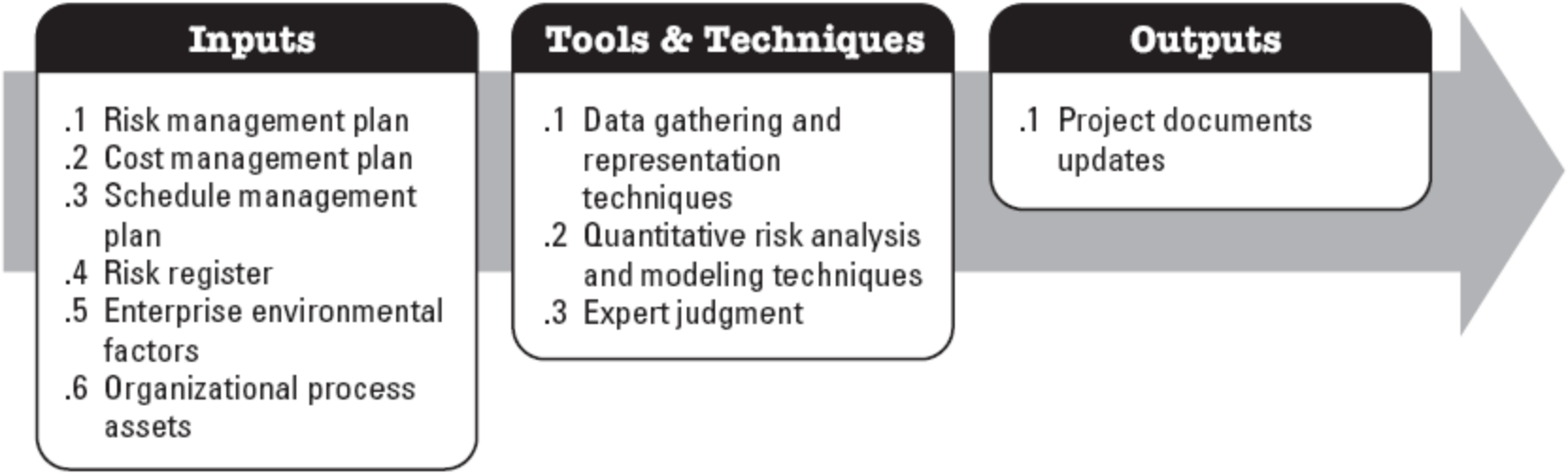
LESSON7. Perform Quantitative Risk Analysis
7.2 Critical Success Factors

6- Interrelationships Between Risks in Quantitative Risk Analysis

- Individual risks in the project model may be related to each other.
  For example, several risks may have a common root cause and therefore are likely to occur together.
  - This possibility is sometimes addressed by correlating the risks that are related, ensuring that they generally occur together during the analysis.
  - Another common way to represent the risks which occur together is by using the risk register listing of the risks or root cause and attaching it to several project elements such as schedule activities or cost elements.
- When a particular risk occurs, the affected elements will all experience the effect of that risk together.

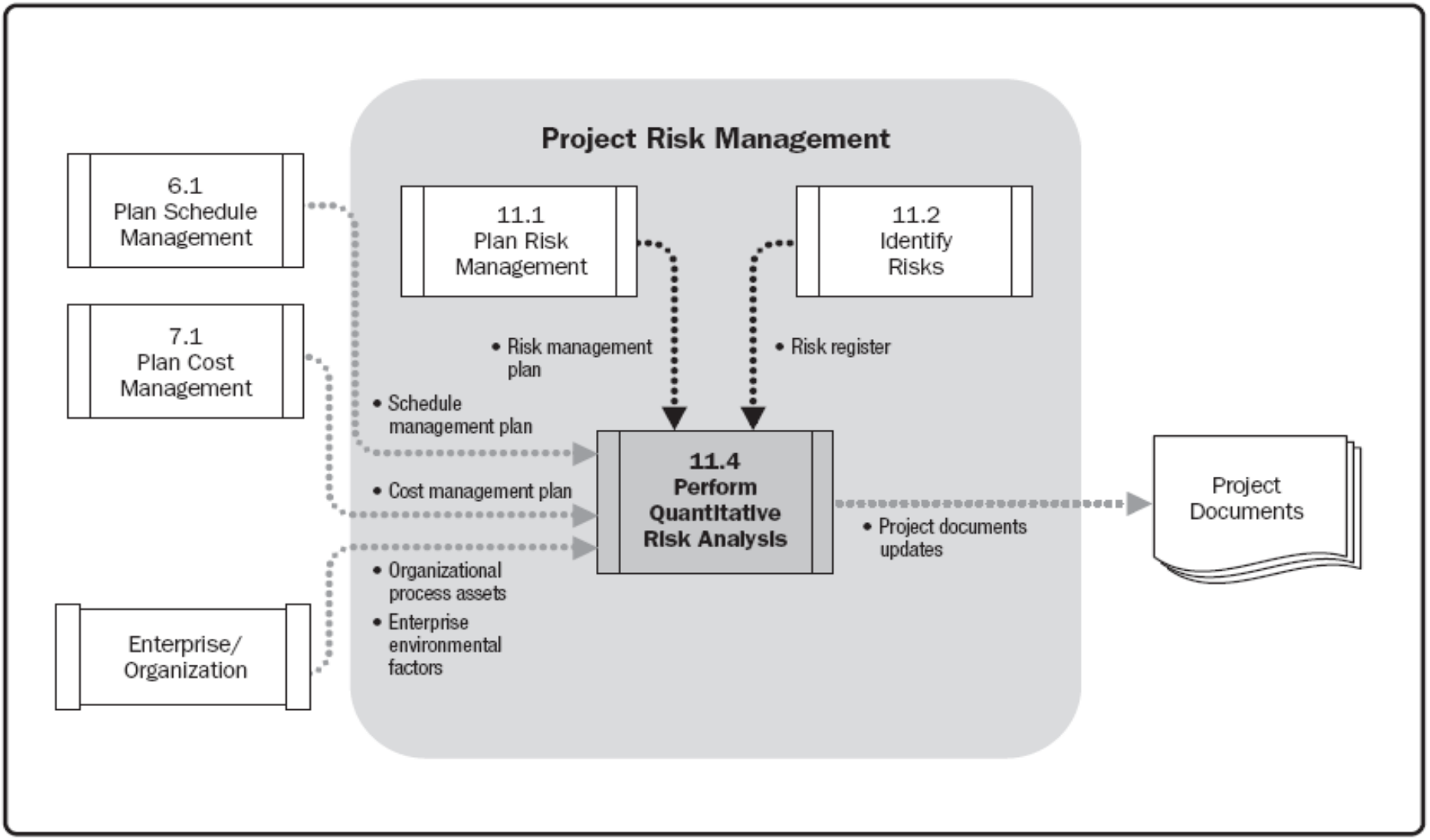
LESSON7. Perform Quantitative Risk Analysis
7.3 Inputs, Tools & Techniques, and Outputs

Inputs, Tools & Techniques, and Outputs



LESSON7. Perform Quantitative Risk Analysis
7.3 Inputs, Tools & Techniques, and Outputs

Perform Quantitative Risk Analysis Data Flow Diagram



LESSON7. Perform Quantitative Risk Analysis
7.3.1 Inputs

1- Risk Management Plan

The risk management plan provides guidelines, methods, and tools to be used in quantitative risk analysis.

2- Cost Management Plan

The cost management plan provides guidelines on establishing and managing risk reserves.

3- Schedule Management Plan

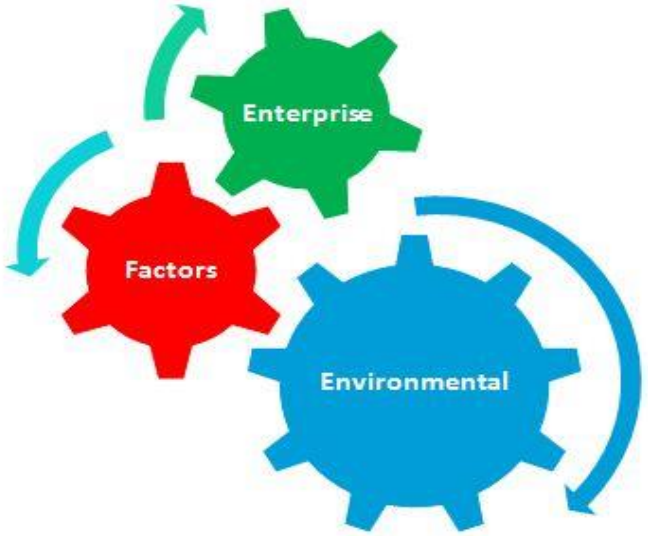
The schedule management plan provides guidelines on establishing and managing risk reserves.

4- Risk Register

The risk register is used as a reference point for performing quantitative risk analysis.

LESSON7. Perform Quantitative Risk Analysis
7.3.1 Inputs

5- Enterprise Environmental Factors



6- Organizational Process Assets

LESSON7. Perform Quantitative Risk Analysis
7.3.2 Tools and Techniques

1- Data Gathering and Representation Techniques

1-1 Interviewing

- Interviewing techniques based on experience and historical data to quantify the probability and impact of risks on project objectives.
- The information depends upon the type of used probability distributions.

  For instance, information would be gathered on the optimistic (low), pessimistic (high), and most likely scenarios for some commonly used distributions.
- Reliability and credibility of the interviews by documenting the rationale of the risk ranges and the assumptions behind them.

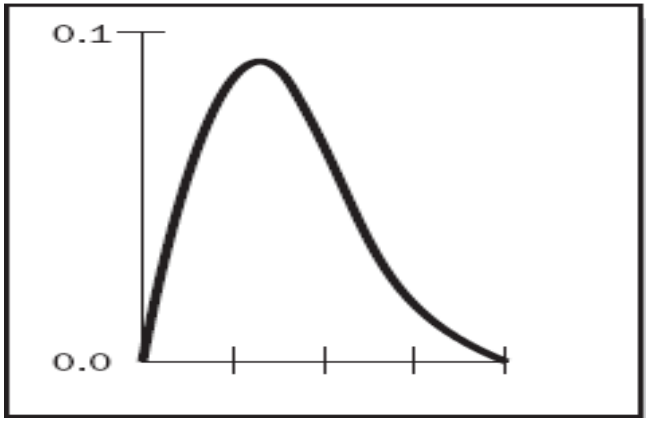
LESSON7. Perform Quantitative Risk Analysis
7.3.2 Tools and Techniques

1- Data Gathering and Representation Techniques

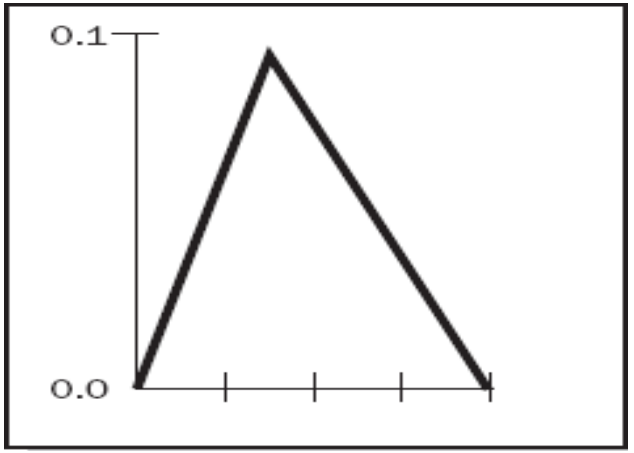
1-2 Probability distributions

Continuous probability distributions

- Continuous probability distributions are used extensively in modeling and simulation.
- Represent the uncertainty in values such as
  - Durations of schedule activities.
  - Costs of project components.
- Beta and Triangular distribution are widely used during the quantitative risk analysis.
- Other commonly used distributions include the uniform, normal and lognormal.
- Horizontal (X) axes represent possible values of time or cost and the vertical (Y) axes represent relative likelihood.



Beta distribution



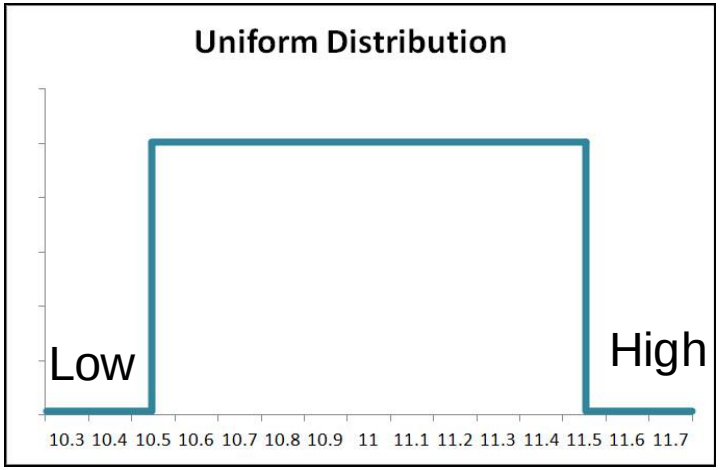
Triangular distribution

LESSON7. Perform Quantitative Risk Analysis
7.3.2 Tools and Techniques

Continuous probability distributions contd.

Uniform distributions Can be used if there is **no obvious value** that is more likely than any other between specified **high** and **low bounds.**

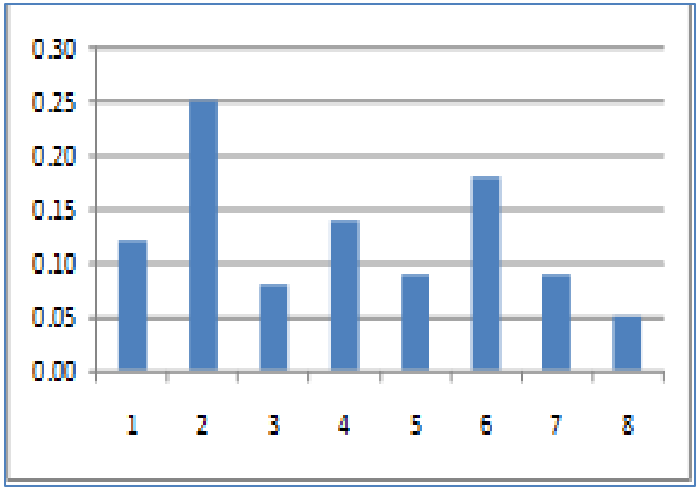
Used in early concept stage of design.



Discrete distributions

Discrete distributions can be used to represent **uncertain events.**
such as the:

- Outcome of a test.
- Possible scenario in a decision tree.



LESSON7. Perform Quantitative Risk Analysis
7.3.2 Tools and Techniques

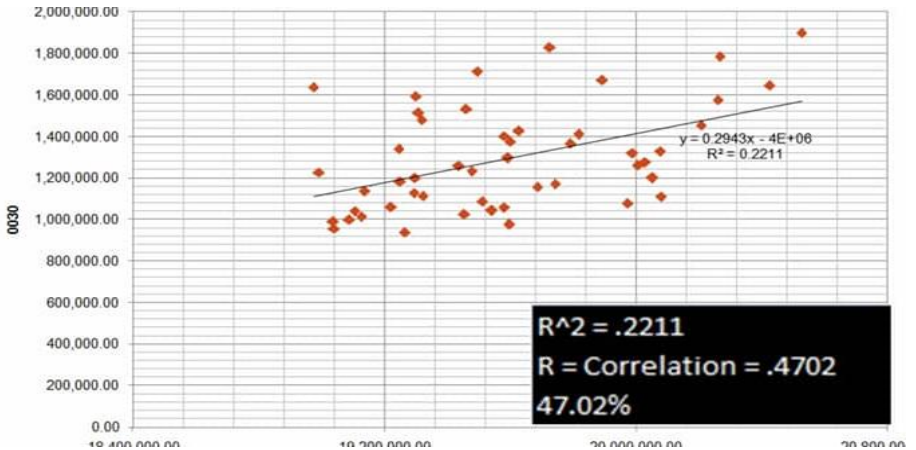
2- Quantitative Risk Analysis and Modeling Techniques

Commonly used techniques use both event-oriented and project-oriented analysis approaches

2-1 Sensitivity analysis.

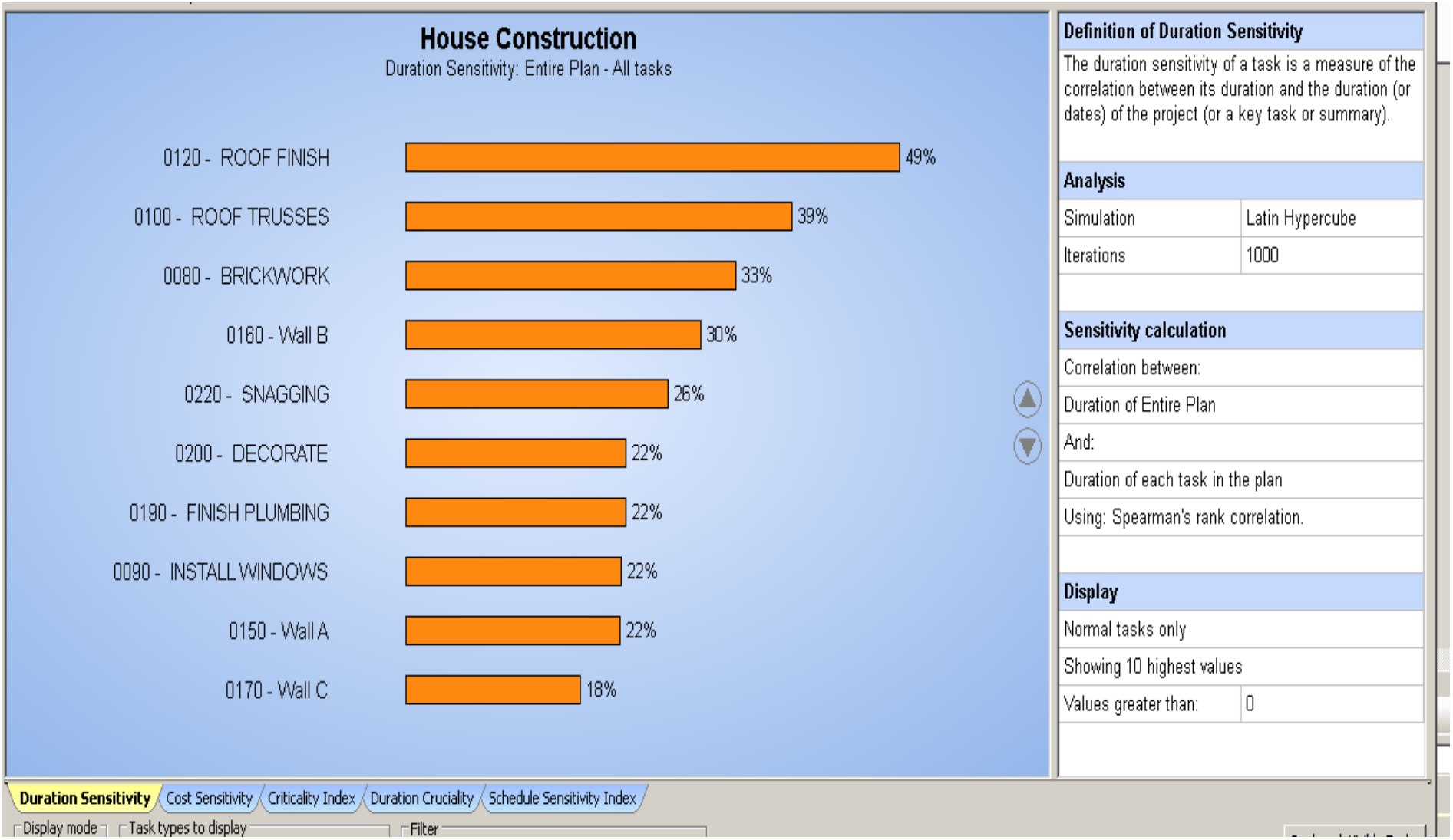
- Determine which risks have the most potential impact on the project.
- Understand how the variations in project's objectives correlate with variations in different uncertainties.
- Examines how the uncertainty of each project element affects the objective being studied when all other uncertain elements are held at their baseline values

Tornado Charts - Meaning (item 0030)
Oil and Gas Cost Model
Cost Sensitivity: Entire Plan - All tasks
0060 - Piping & Insulation Supply 59%
0150 - Project Management 48%
0030 - Structural Steel & Painting 47%
0040 - Mechanical Equipment Supply 40%
0010 - Civils 40%
0130 - Preliminary Costs 28%
0070 - Piping & Insulation Erection 26%
0050 - Mechanical Equipment Erection 16%
0120 - Effluent Treatment Plant 15%
0090 - Electrical Erection 10%



LESSON7. Perform Quantitative Risk Analysis
7.3.2 Tools and Techniques

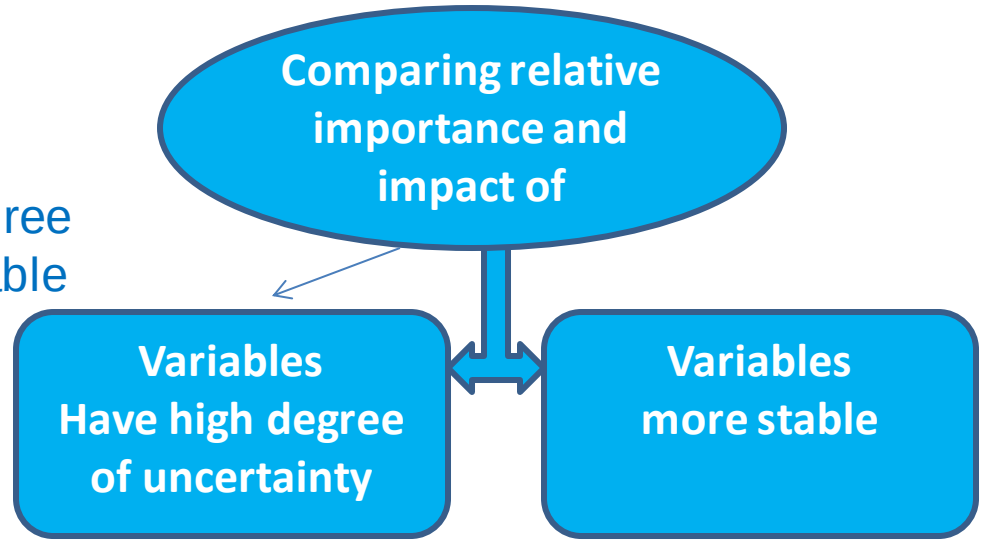
2- Quantitative Risk Analysis and Modeling Techniques



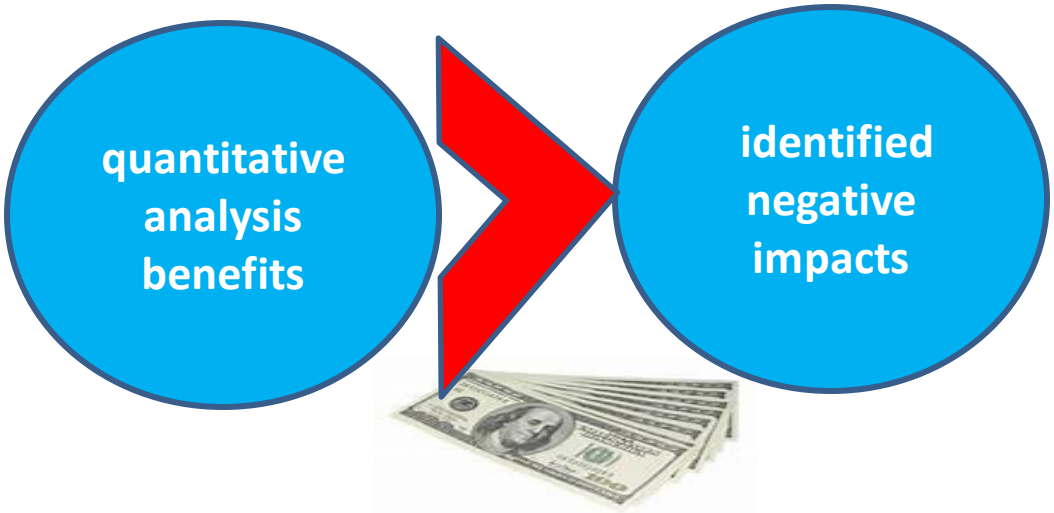
LESSON7. Perform Quantitative Risk Analysis
7.3.2 Tools and Techniques

Tornado diagram

- Comparing relative importance and impact of variables that have a high degree of uncertainty to those that are more stable



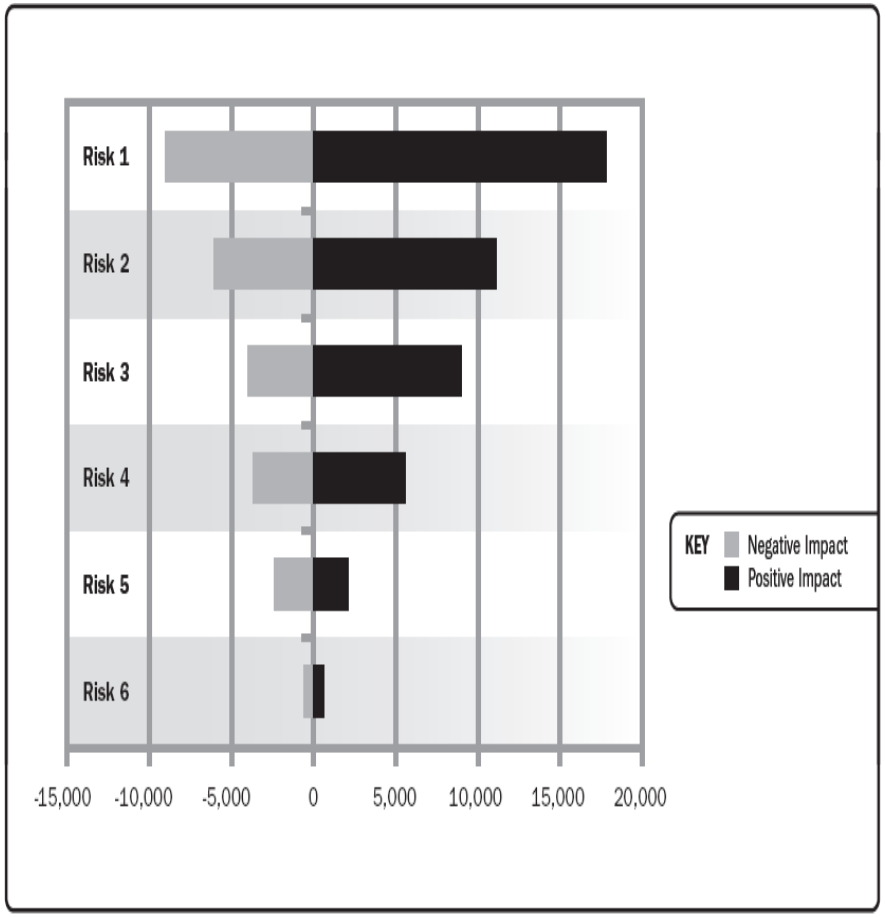
- Analyzing risks whose quantitative analysis highlights possible benefits greater than corresponding identified negative impacts



LESSON7. Perform Quantitative Risk Analysis
7.3.2 Tools and Techniques

Tornado diagram

- A tornado diagram is a special type of bar chart.
- used in sensitivity analysis for comparing the relative importance of the variables.
- The Y-axis contains each type of uncertainty at base values.
- The X-axis contains the spread or correlation of the uncertainty to the studied output.
- Each uncertainty contains a horizontal bar and is ordered vertically to show uncertainties with a decreasing spread from the base values.



LESSON7. Perform Quantitative Risk Analysis
7.3.2 Tools and Techniques

Expected monetary value (EMV) analysis

Statistical concept that calculates the average (weighted average or expected cost or benefit) outcome when the future includes scenarios that may or may not happen (**analysis under uncertainty**).

- **EMV** of **opportunities** are generally expressed as **positive values (+).**
- **EMV** of **threats** are generally expressed as **negative values (-).**
- **EMV** requires a **risk neutral** neither risk averse nor risk seeking.
- **EMV** for a project is calculated by **multiplying** the value of each possible **outcome** by its **probability** of occurrence and **adding** the products together.
- A common use of **EMV** is a decision tree analysis.
- **EMV** based on liner utility function

LESSON7. Perform Quantitative Risk Analysis
7.3.2 Tools and Techniques

Expected monetary value (EMV) analysis

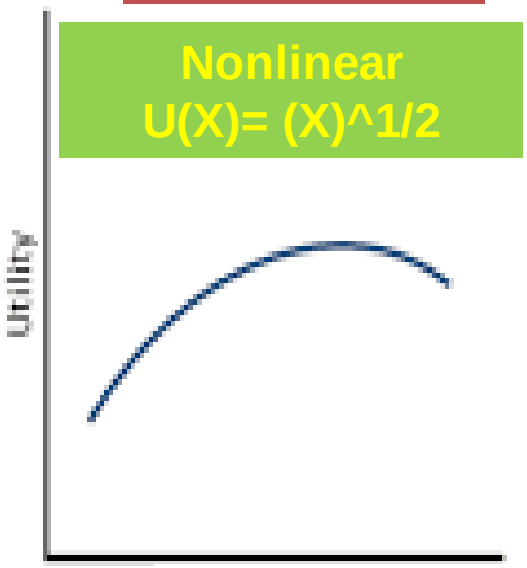
Utility Function

Used to define:

- The stakeholders risk attitudes.
- How they dealing with risk.
- The ability of stakeholders to deal with risks

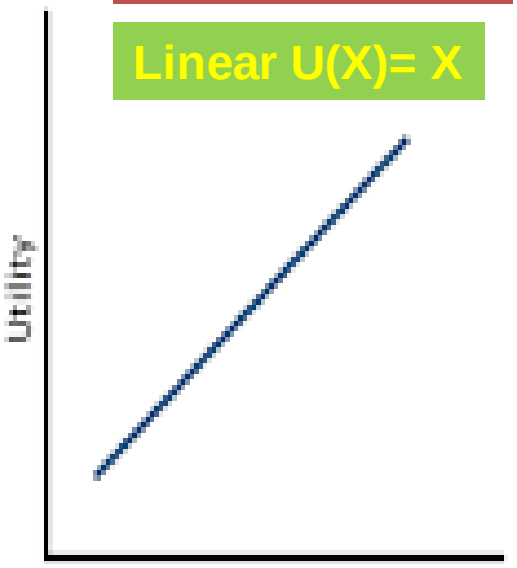
RISK AVERSE

Nonlinear
U(X)= (X)^1/2



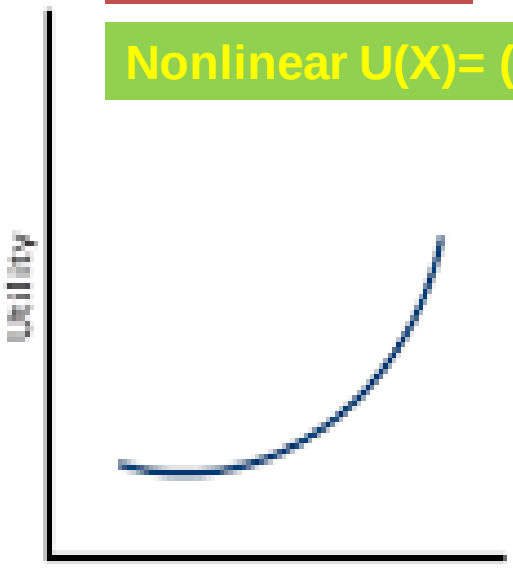
RISK NEUTRAL

Linear U(X)= X



RISK SEEKER

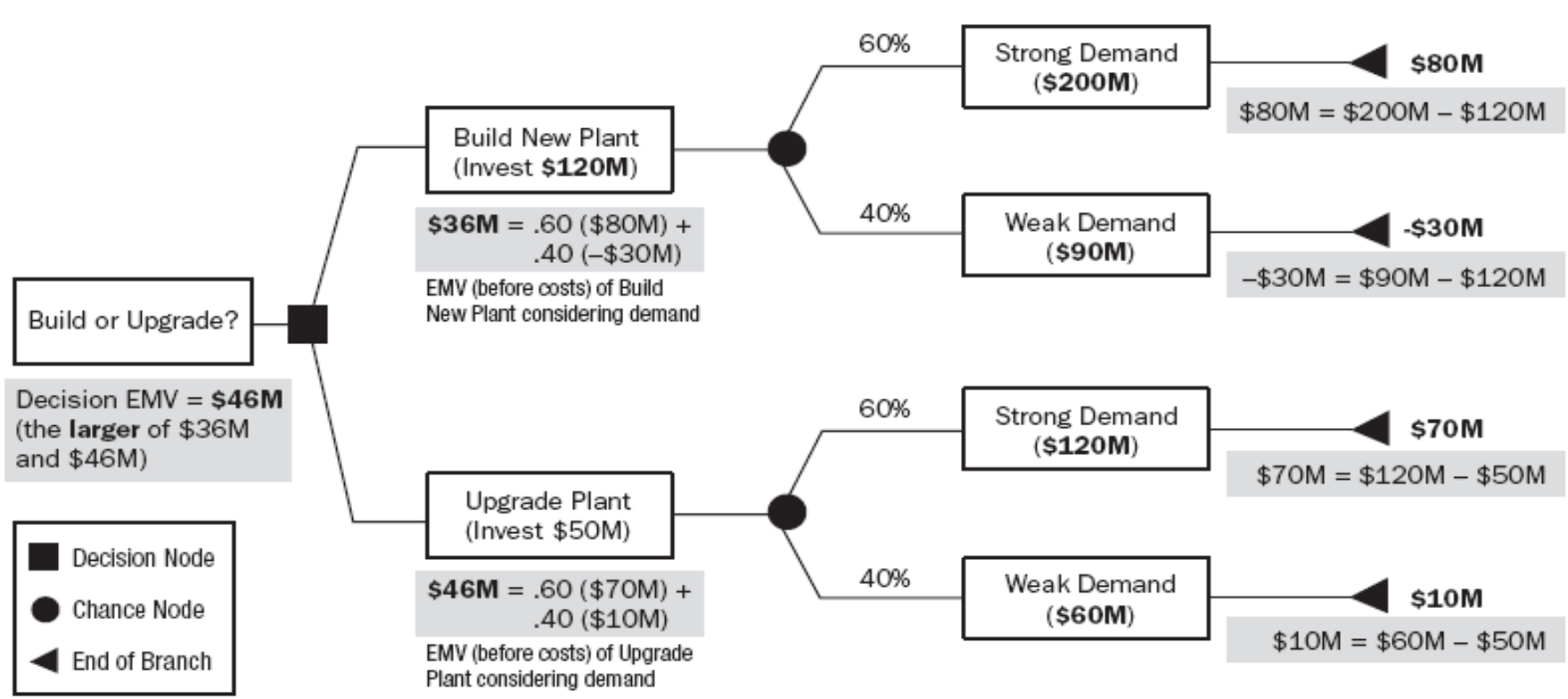
Nonlinear U(X)= (X)^2



LESSON7. Perform Quantitative Risk Analysis
7.3.2 Tools and Techniques

2-2 Expected monetary value (EMV) analysis

Decision Definition	Decision Node	Chance Node	Net Path Value
Decision to be Made	**Input:** Cost of Each Decision **Output:** Decision Made	**Input:** Scenario Probability, Reward if it Occurs **Output:** Expected Monetary Value (EMV)	**Computed:** Payoffs minus Costs along Path



LESSON7. Perform Quantitative Risk Analysis
7.3.2 Tools and Techniques

2-2 Expected monetary value (EMV) analysis

Example of an Expected Monetary Value Calculation when there are Three Uncertain Product Demand Scenarios

Example of an Expected Monetary Value (EMV) Calculation for a Business Strategy that Depends on Uncertain Market Demand			
Uncertain Outcome	**Reward ($000)**	**Probability (%)**	**Contribution to EMV**
High Market Demand	800	30%	240.0
Moderate Market Demand	450	45%	202.5
Low Market Demand	250	25%	62.5
TOTAL EMV			**505.0**

LESSON7. Perform Quantitative Risk Analysis
7.3.2 Tools and Techniques

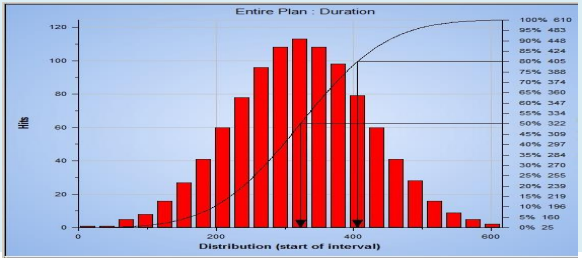
2-2 Expected monetary value (EMV) analysis

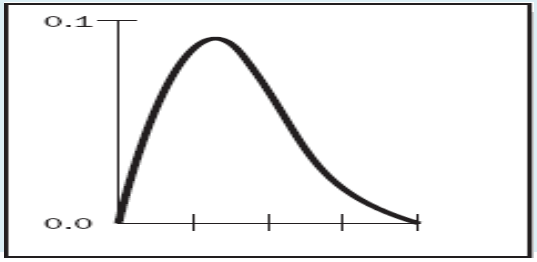
Technique	Strengths	Weaknesses	CSFs
Expected Monetary Value (EMV)	• EMV allows the user to calculate the weighted average (expected) value of an event that includes uncertain outcomes • It is well-suited to Decision Tree Analysis • EMV incorporates both the probability and impact of the uncertain events • EMV is a simple calculation that does not require specialized software	• Assessment of probability of risky events' occurring and of their impact can be difficult to make • EMV provides only the expected value of uncertain events; risk decisions often require more information than EMV can provide • EMV is sometimes used in situations where Monte Carlo simulation would be more appropriate and provide additional information about risk	• Identification of all possible events that need to be included in the EMV calculation • Access to historical data or expert opinions on the values of probability and impact that are needed for the calculation of EMV • Understanding of the difference between EMV and the output of simulation tools such as Monte Carlo analysis

Perform Quantitative Risk Analysis
7.3.2 Tools and Techniques

2-3 Modeling and simulation

- A project simulation uses a **model** that translates the specified detailed uncertainties of the project into their **potential impact** on project objectives.
- Simulations are typically performed using the **Monte Carlo technique** **OR** **Latin Hypercube LHC.**
- The project model is **computed many times** (iterated), with the **input values** (cost estimates= cost line-items or activity durations) chosen at **random** for each iteration from the **probability distributions** of these variables to build:
  - **Histogram** (total cost or completion date) is calculated from the iterations
  - **Cumulative probability** from which to compute desired contingency reserves of time or cost.
- Determine the relative importance of each input in determining the overall project cost and schedule risk.

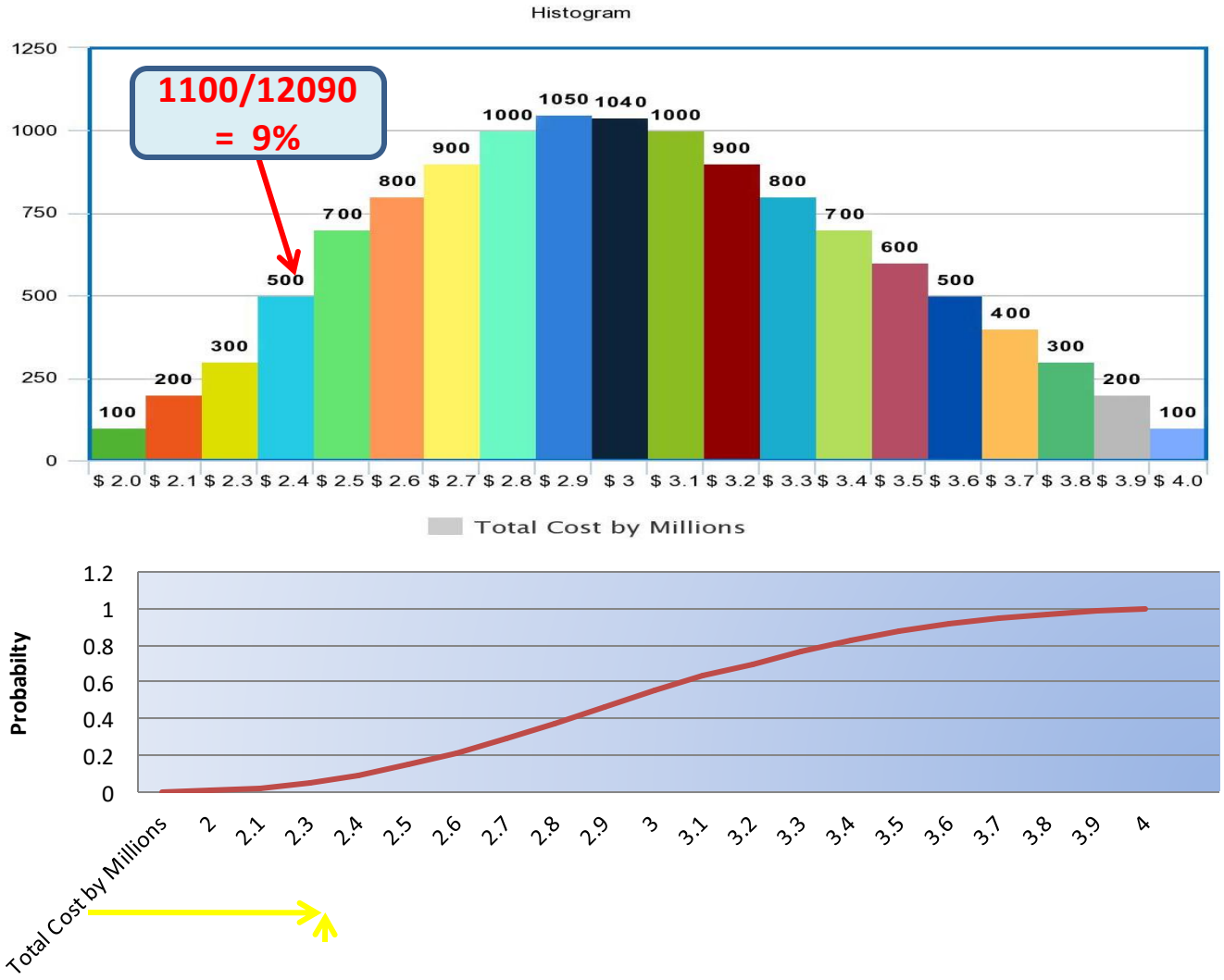


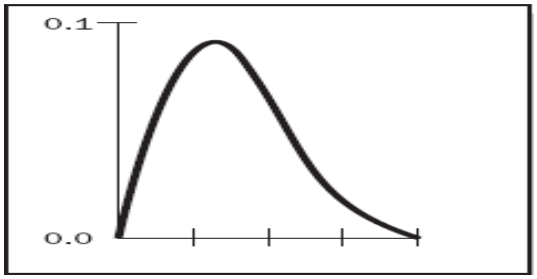


Perform Quantitative Risk Analysis
7.3.2 Tools and Techniques

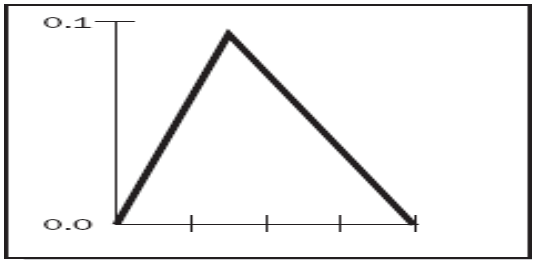
Histogram

Total Iterations 12090

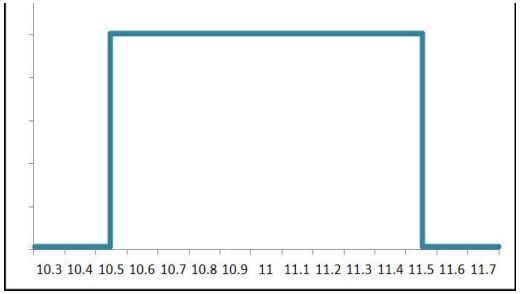




Beta distribution



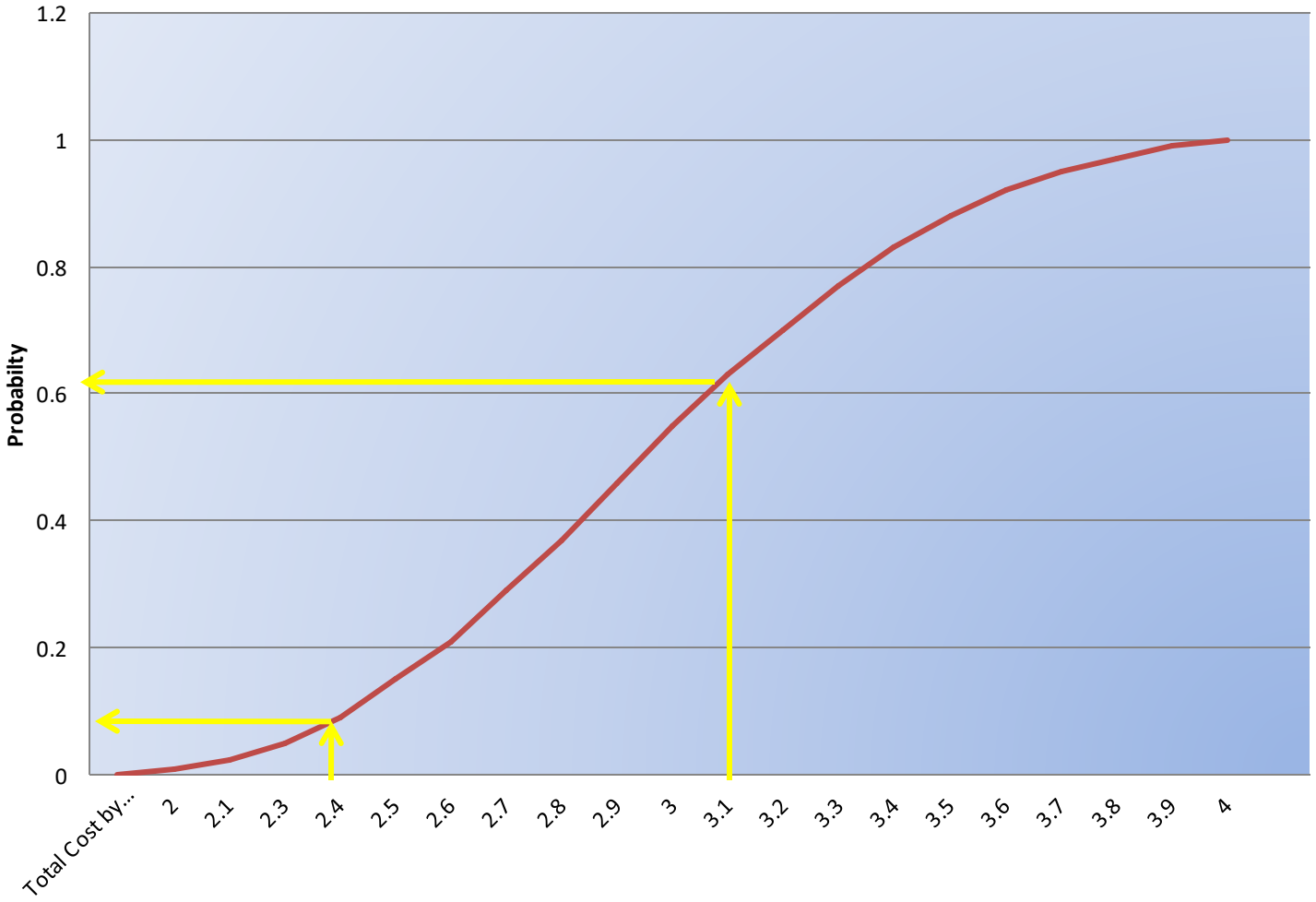
Triangular distribution



Uniform distribution

Perform Quantitative Risk Analysis
7.3.2 Tools and Techniques

Cumulative Probability



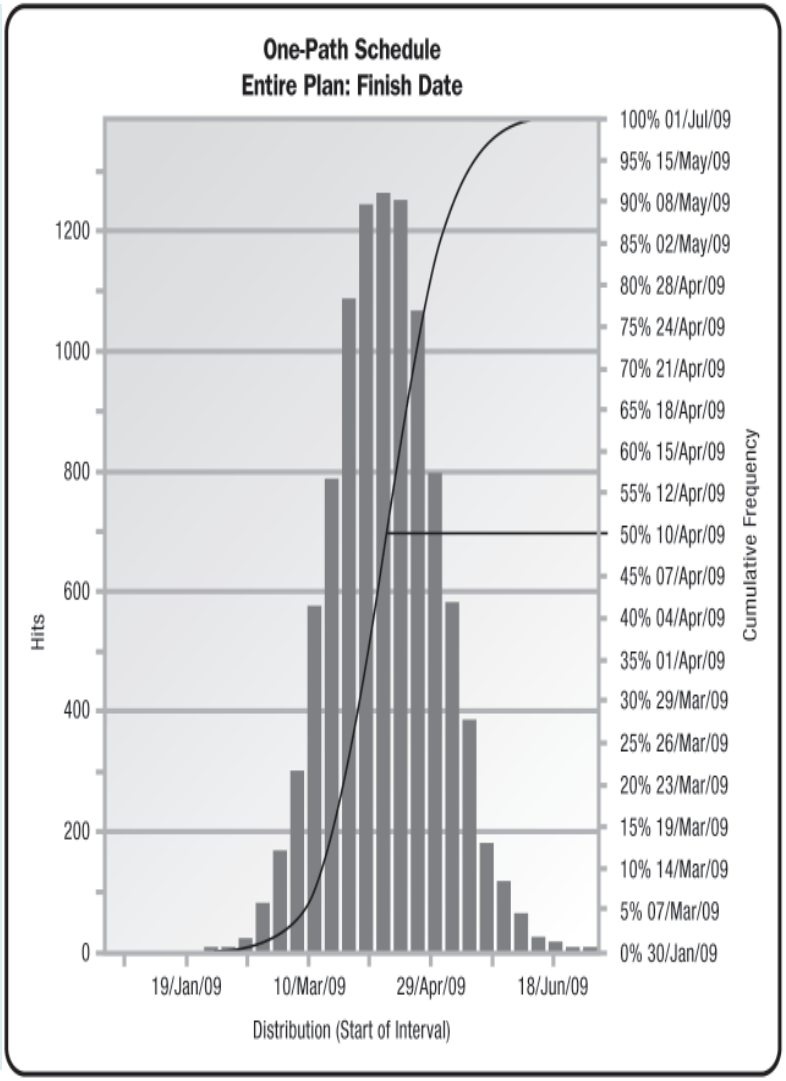
Total Cost by Millions	Probabilty %
4	100%
3.9	99%
3.8	97%
3.7	95%
3.6	92%
3.5	88%
3.4	83%
3.3	77%
3.2	70%
3.1	63%
3	55%
2.9	46%
2.8	37%
2.7	29%
2.6	21%
2.5	15%
2.4	9%
2.3	4.90%
2.1	2.40%
2	0.80%

Perform Quantitative Risk Analysis
7.3.2 Tools and Techniques

Monte Carlo Simulation for Schedule Risk Analysis

- Using :
  1. Schedule network diagram.
  2. Duration estimates (**O , M, P**).
  3. Probability Distribution

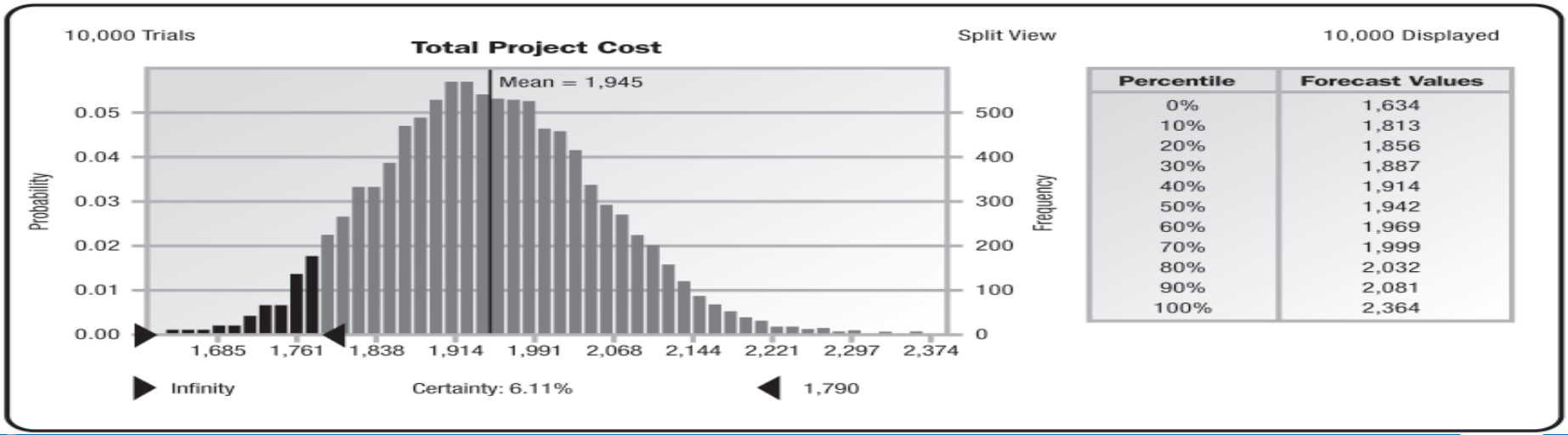
- The output:
  - The probability of achieving the completion date.
  - List of completion dates with confidence levels.
  - Contingency reserves to bring the risk to level acceptable to the organization.
  - The relative importance of each input in determining the overall project schedule Risk.



Perform Quantitative Risk Analysis
7.3.2 Tools and Techniques

Monte Carlo Simulation for Cost Risk Analysis

- The simulation uses
  1. Cost estimates(cost line-items) .
  2. Probability distribution.
- The output from a cost risk simulation is the
  1. Probability of achieving the cost objective.
  2. List of total cost with confidence.
  3. Contingency reserves to bring the risk to level acceptable to the organization.
  4. The relative importance of each input in determining the overall project cost Risk.



Percentile	Forecast Values
0%	1,634
10%	1,813
20%	1,856
30%	1,887
40%	1,914
50%	1,942
60%	1,969
70%	1,999
80%	2,032
90%	2,081
100%	2,364

Perform Quantitative Risk Analysis
7.3.2 Tools and Techniques

Monte Carlo Simulation

Technique	Strengths	Weaknesses	CSFs
Monte Carlo Simulation	• Used primarily for project schedule and cost risk analysis in strategic decisions • Allows all specified risks to vary simultaneously • Calculates quantitative estimates of overall project risk; reflects the reality that several risks may occur together on the project • Provides answers to questions such as (1) How likely is the base plan to be	• Schedules are not simple and often cannot be used in simulation without significant de-bugging by an expert scheduler • The quality of the input data depends heavily on the expert judgment and the effort and expertise of the risk analyst • Simulation is sometimes resisted by management as being unnecessary or too sophisticated	• Creation of a good project model. Typical models include the cost estimate and the schedule • Use summary-level models such as project schedules and cost estimates • Access to high-quality data on risks including the risk's impact on project elements, uncertain activity durations and uncertain cost elements; the credibility depends on

Perform Quantitative Risk Analysis
7.3.2 Tools and Techniques

Monte Carlo Simulation

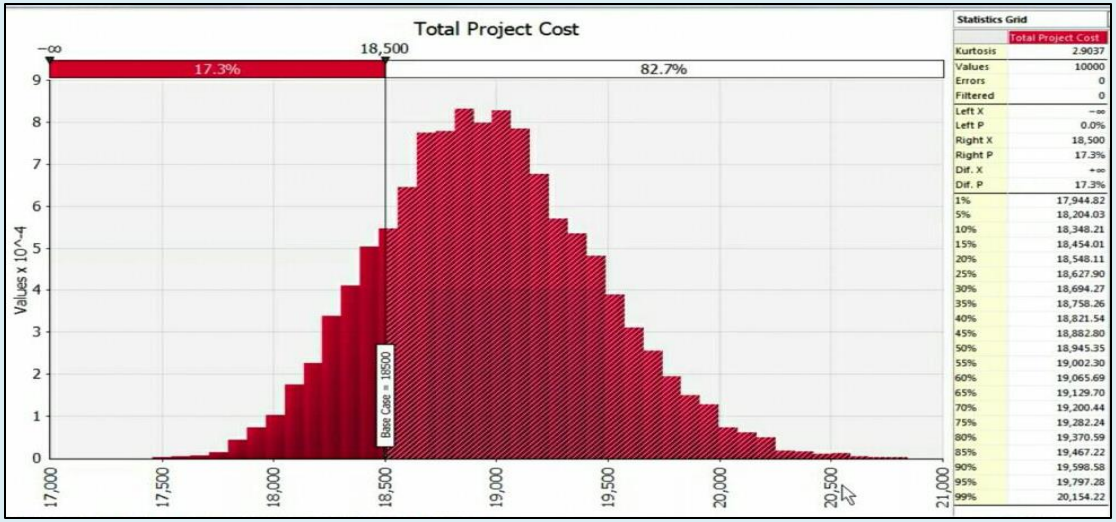
Technique	Strengths	Weaknesses	CSFs
Monte Carlo Simulation	successful? (2) How much contingency in time and cost do we need to achieve our desired level of confidence? (3) Which activities are important in determining the overall project risk?	compared to traditional project management tools • Monte Carlo simulation requires specialized software which must be acquired and learned, causing a barrier to its use • Will produce unrealistic results unless input data include both threats and opportunities	the quality of the data collected • Use of correct simulation tools

Perform Quantitative Risk Analysis
Monte Carlo Questions

ABC is a big Organization working in Construction by old style, they got new project **with Total Cost 18,821,540$** the customer requests to work by the Up to date style and announced that the risk management very important for project success. Therefore the organization hired a subject matter Expert to work as Risk manager during the project life cycle.

The Sponsor, Project manager and the risk manager in the meeting, then the Risk manager open the Lap top to explain the benefits of risk management and how and when should be implemented, during the presentation the sponsor notice a complicated graphics, he ask the Risk manager, what is this ,he told Mote Carlo Simulation technique as below. The risk manager explained the technique then the Sponsor asked him. **What is the probability of achieving the planned cost objective?** The values in the graph by thousands.

A) 40%.
B) 50%.
C) 80%.
D) 30%.

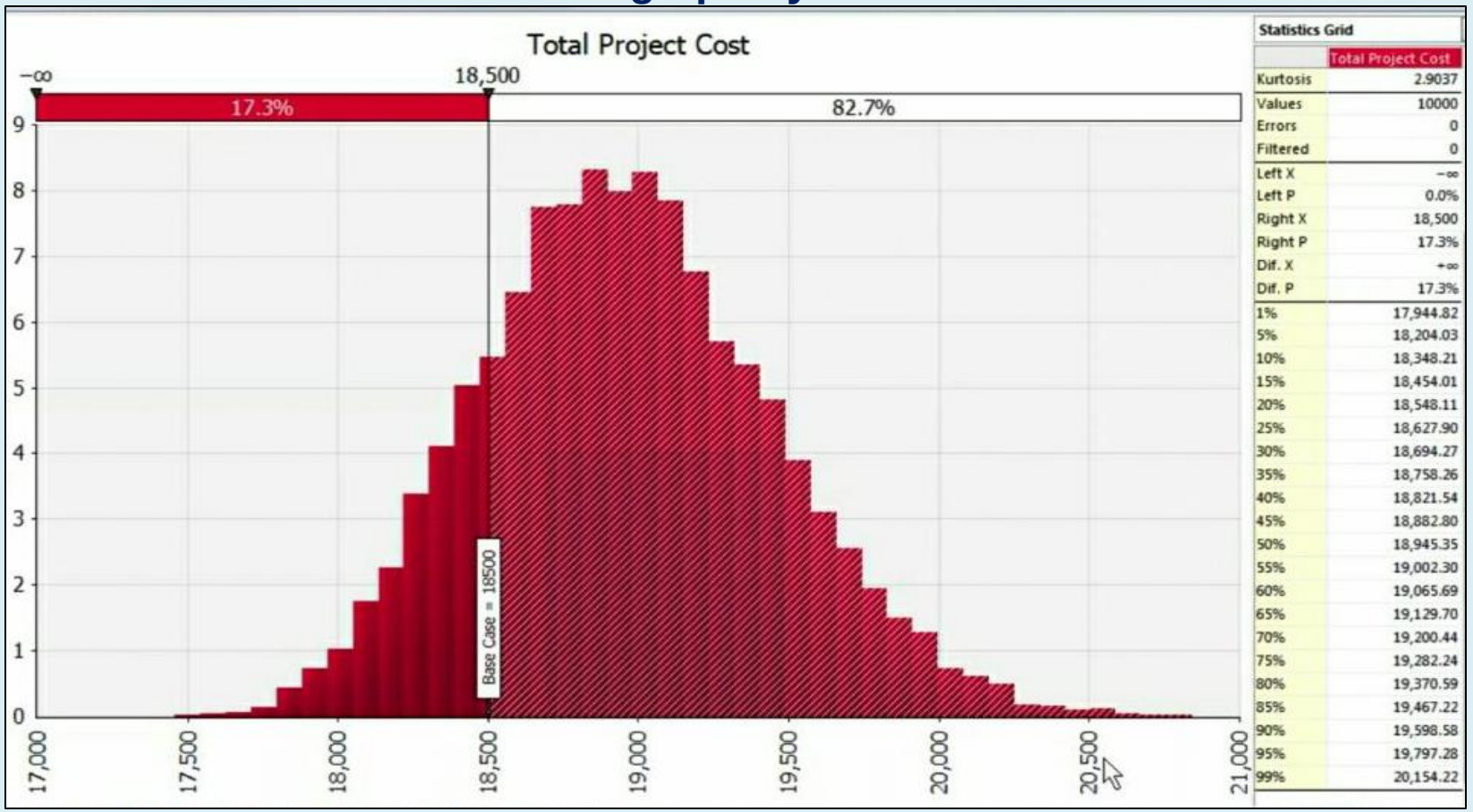


Perform Quantitative Risk Analysis
Monte Carlo Questions

Q1) Total Cost 18,821,540. What is the probability of achieving the planned cost objective?

The values in the graph by thousands.

A) 40%
B) 50%
C) 80%
D) 30%



Statistics Grid

	Total Project Cost
Kurtosis	2.9037
Values	10000
Errors	0
Filtered	0
Left X	−∞
Left P	0.0%
Right X	18,500
Right P	17.3%
Dif. X	+∞
Dif. P	17.3%
1%	17,944.82
5%	18,204.03
10%	18,348.21
15%	18,454.01
20%	18,548.11
25%	18,627.90
30%	18,694.27
35%	18,758.26
40%	18,821.54
45%	18,882.80
50%	18,945.35
55%	19,002.30
60%	19,065.69
65%	19,129.70
70%	19,200.44
75%	19,282.24
80%	19,370.59
85%	19,467.22
90%	19,598.58
95%	19,797.28
99%	20,154.22

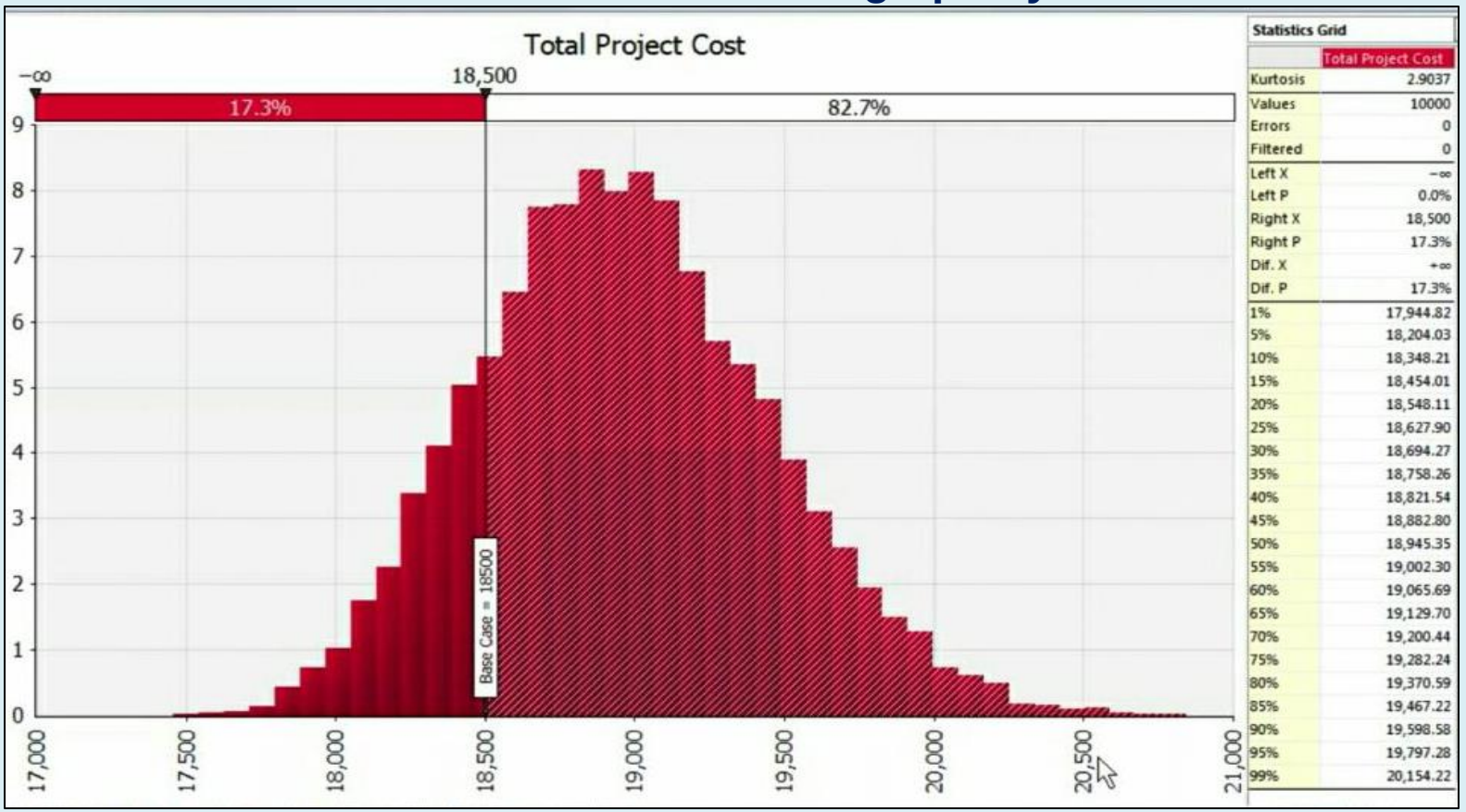
From the graph check the probability beside 18,821,540 = 40%

Correct Answer is A

Perform Quantitative Risk Analysis
Monte Carlo Questions

Q2) Total Cost 18,821,540. What is the contingency reserve if the confidence level change from P40 TO P75%? **The values in the graph by thousands.**

A) 460,700$.
B) 560,600$.
C) 600,000$.
D) 550,000$.



Statistics Grid	Total Project Cost
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5%	18,204.03
10%	18,348.21
15%	18,454.01
20%	18,548.11
25%	18,627.90
30%	18,694.27
35%	18,758.26
40%	18,821.54
45%	18,882.80
50%	18,945.35
55%	19,002.30
60%	19,065.69
65%	19,129.70
70%	19,200.44
75%	19,282.24
80%	19,370.59
85%	19,467.22
90%	19,598.58
95%	19,797.28
99%	20,154.22

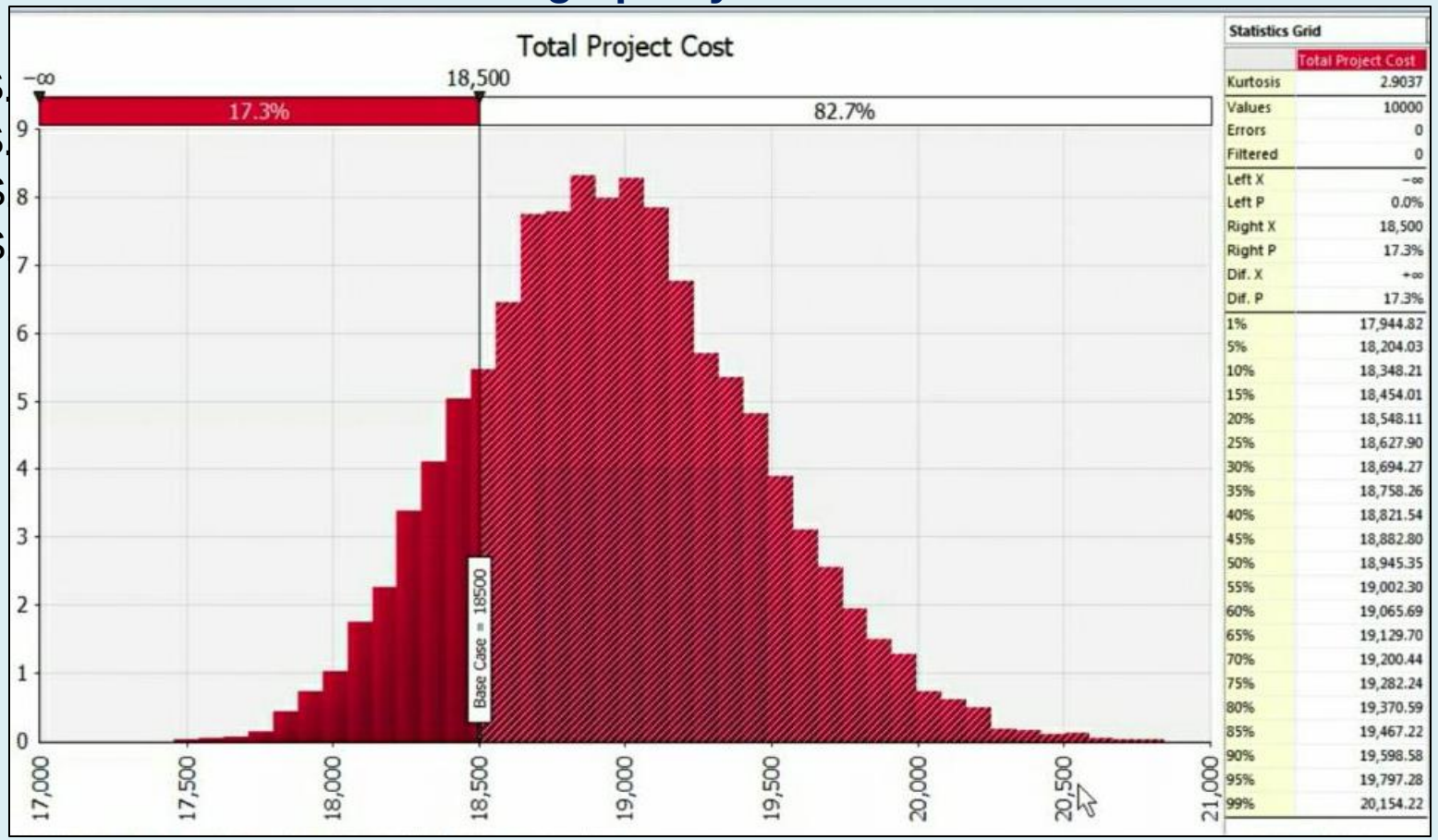
From the graph check the Total cost beside 75% = 19,282,240 and the budget beside 40% = 18,821,540, then calculate the difference 19,282,240 – 18,821,540 = 460,700$.

Correct answer is A.

Perform Quantitative Risk Analysis
Monte Carlo Questions

Q3) Total Cost 18,821,540. What is the average total cost of the project?
The values in the graph by thousands.

A) 18,460,700$.
B) 19,000,600$.
C) 18,000,000$
D) 18,945,350$



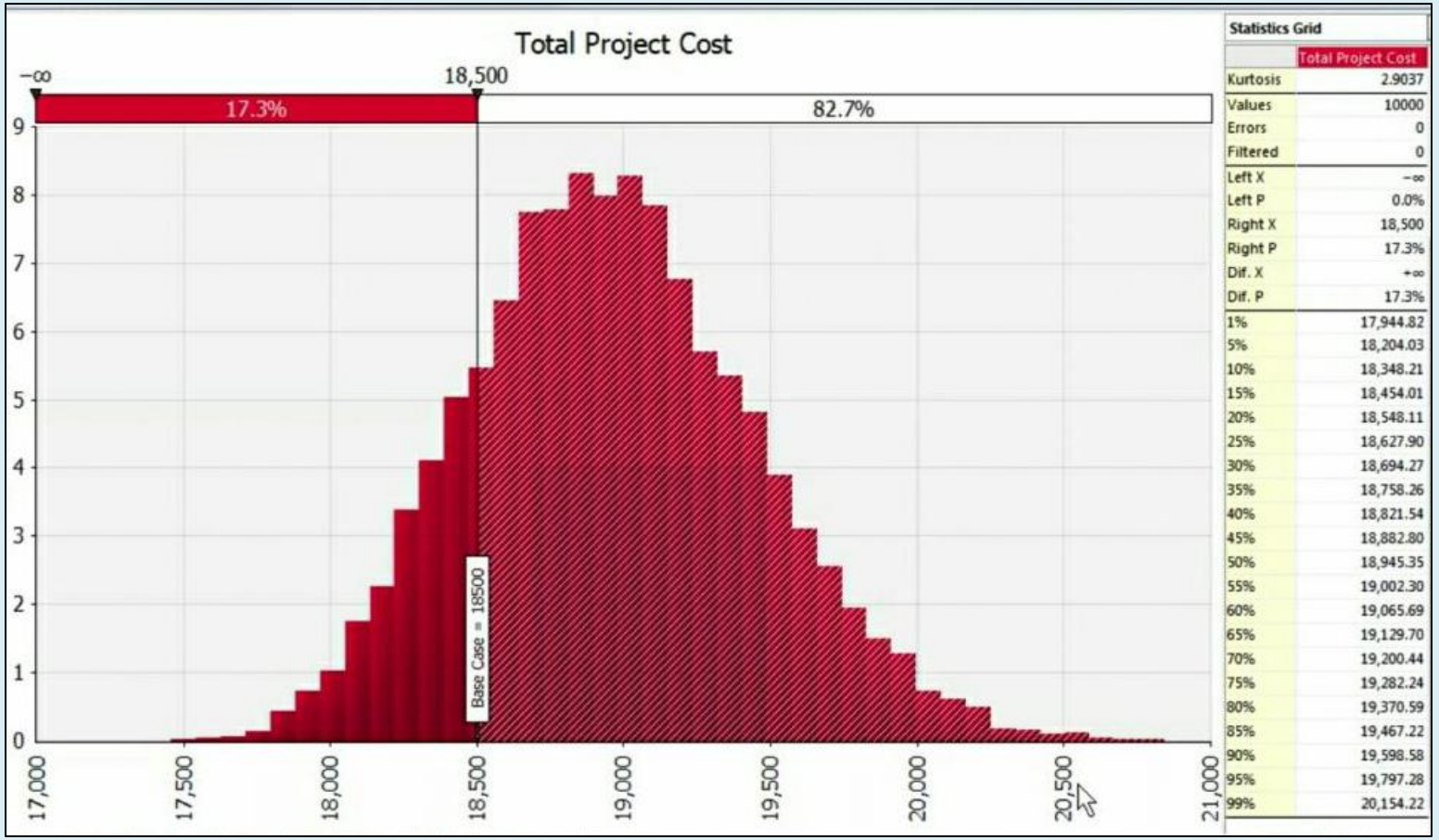
Statistics Grid	Total Project Cost
Kurtosis	2.9037
Values	10000
Errors	0
Filtered	0
Left X	−∞
Left P	0.0%
Right X	18,500
Right P	17.3%
Dif. X	+∞
Dif. P	17.3%
1%	17,944.82
5%	18,204.03
10%	18,348.21
15%	18,454.01
20%	18,548.11
25%	18,627.90
30%	18,694.27
35%	18,758.26
40%	18,821.54
45%	18,882.80
50%	18,945.35
55%	19,002.30
60%	19,065.69
65%	19,129.70
70%	19,200.44
75%	19,282.24
80%	19,370.59
85%	19,467.22
90%	19,598.58
95%	19,797.28
99%	20,154.22

From the graph check the Total cost beside 50% = 18,945,350$.
Correct answer is D.

Perform Quantitative Risk Analysis
Monte Carlo Questions

Q4) Total Cost 18,821,540. What is the probability to complete the project with total cost 19,467,220?

A) 80%.
B) 85%.
C) 75%.
D) 60%.



Statistics Grid

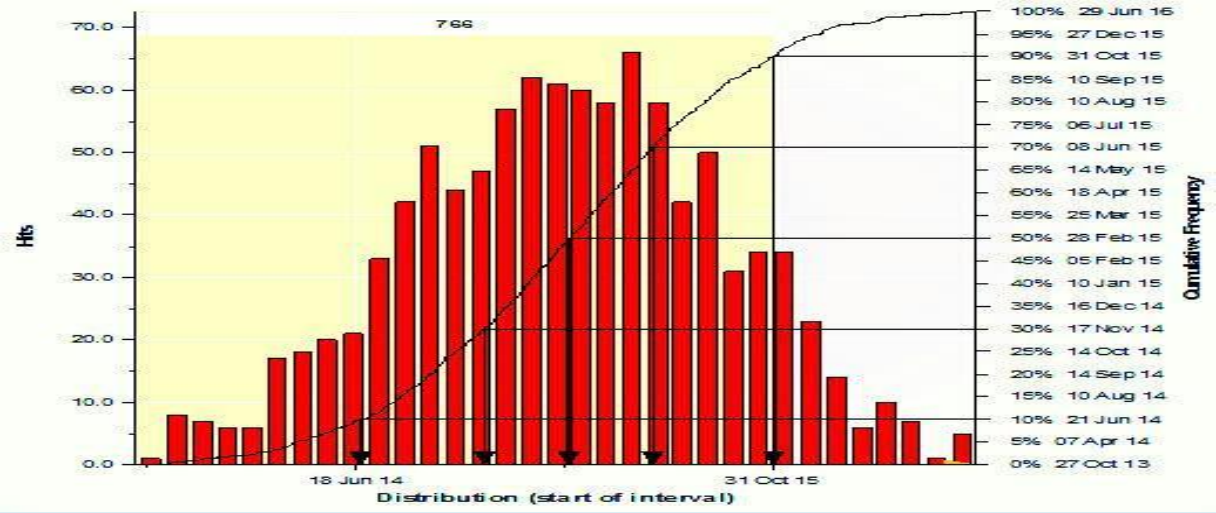
	Total Project Cost
Kurtosis	2.9037
Values	10000
Errors	0
Filtered	0
Left X	−∞
Left P	0.0%
Right X	18,500
Right P	17.3%
Dif. X	+∞
Dif. P	17.3%
1%	17,944.82
5%	18,204.03
10%	18,348.21
15%	18,454.01
20%	18,548.11
25%	18,627.90
30%	18,694.27
35%	18,758.26
40%	18,821.54
45%	18,882.80
50%	18,945.35
55%	19,002.30
60%	19,065.69
65%	19,129.70
70%	19,200.44
75%	19,282.24
80%	19,370.59
85%	19,467.22
90%	19,598.58
95%	19,797.28
99%	20,154.22

From the graph check the probability beside total cost 19,467,220$ = 85%
Correct answer is B.

Perform Quantitative Risk Analysis
Monte Carlo Questions

Q5) MEGA is a big Organization working in Construction by old style, they got new project with completion date 05/Feb/2015 but the customer requirements to work by the Up to date style and announced that the risk management very important for project success. Therefore the organization hired a subject matter Expert to work as Risk manager during the project life cycle. The Sponsor, Project manager and the risk manager in the meeting, then the Risk manager open the Lap top to explain the benefits of risk management and how and when should be implemented, during the presentation the sponsor notice a complicated graphics, he ask the Risk manager, what is this, he told Mote Carlo Sampling technique as below. The risk manager explained the technique then the Sponsor asked, **what is the probability to complete the project on 05, Jul 2015?**

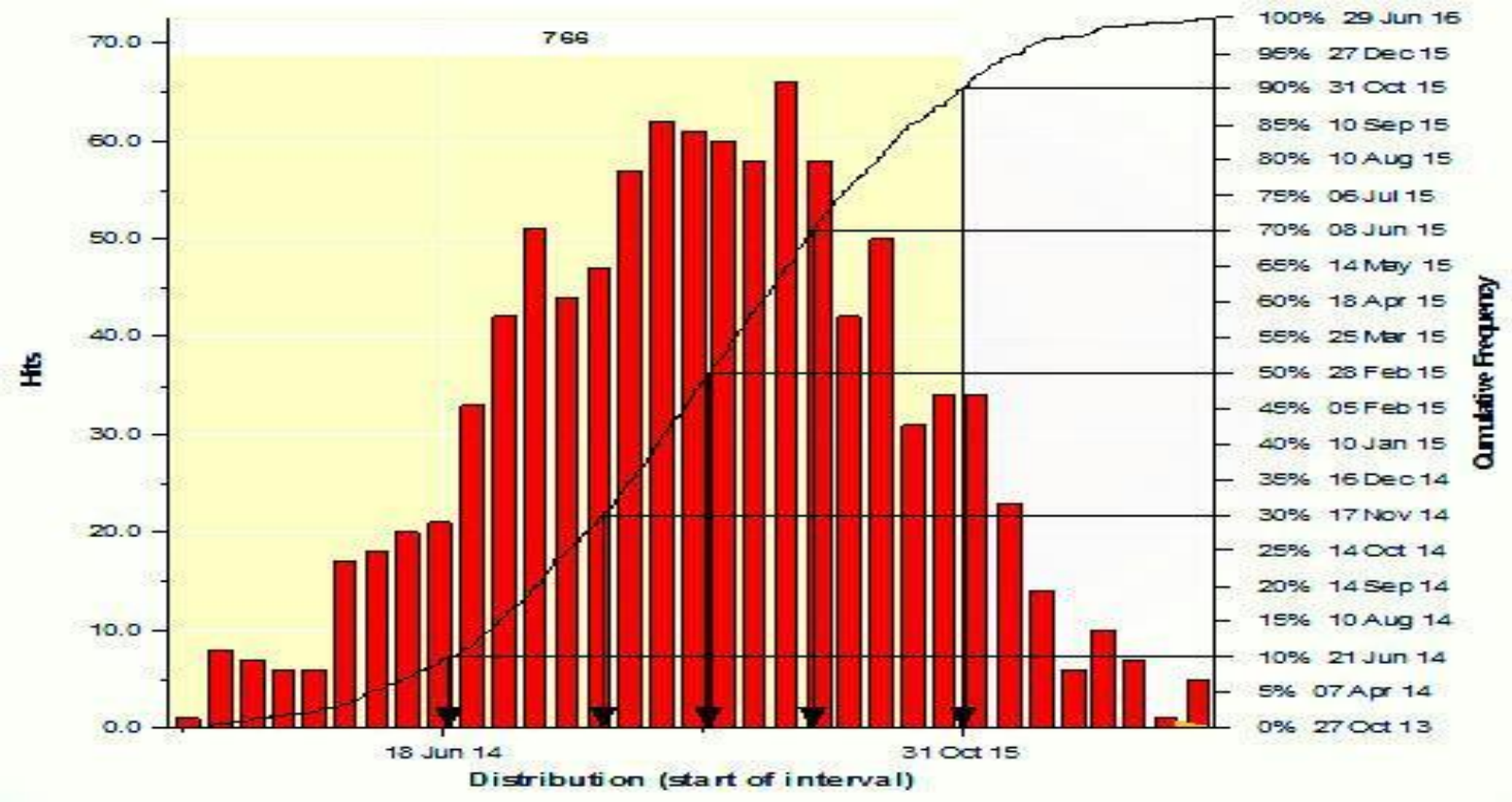
A) 57%.
B) 80%.
C) 75%.
D) 78%.



Perform Quantitative Risk Analysis
Monte Carlo Questions

Q5) completion date 05/Feb/2015. **What is the probability to complete the project on 05, Jul 2015?**

A) 57%.
B) 80%.
C) 75%.
D) 78%.

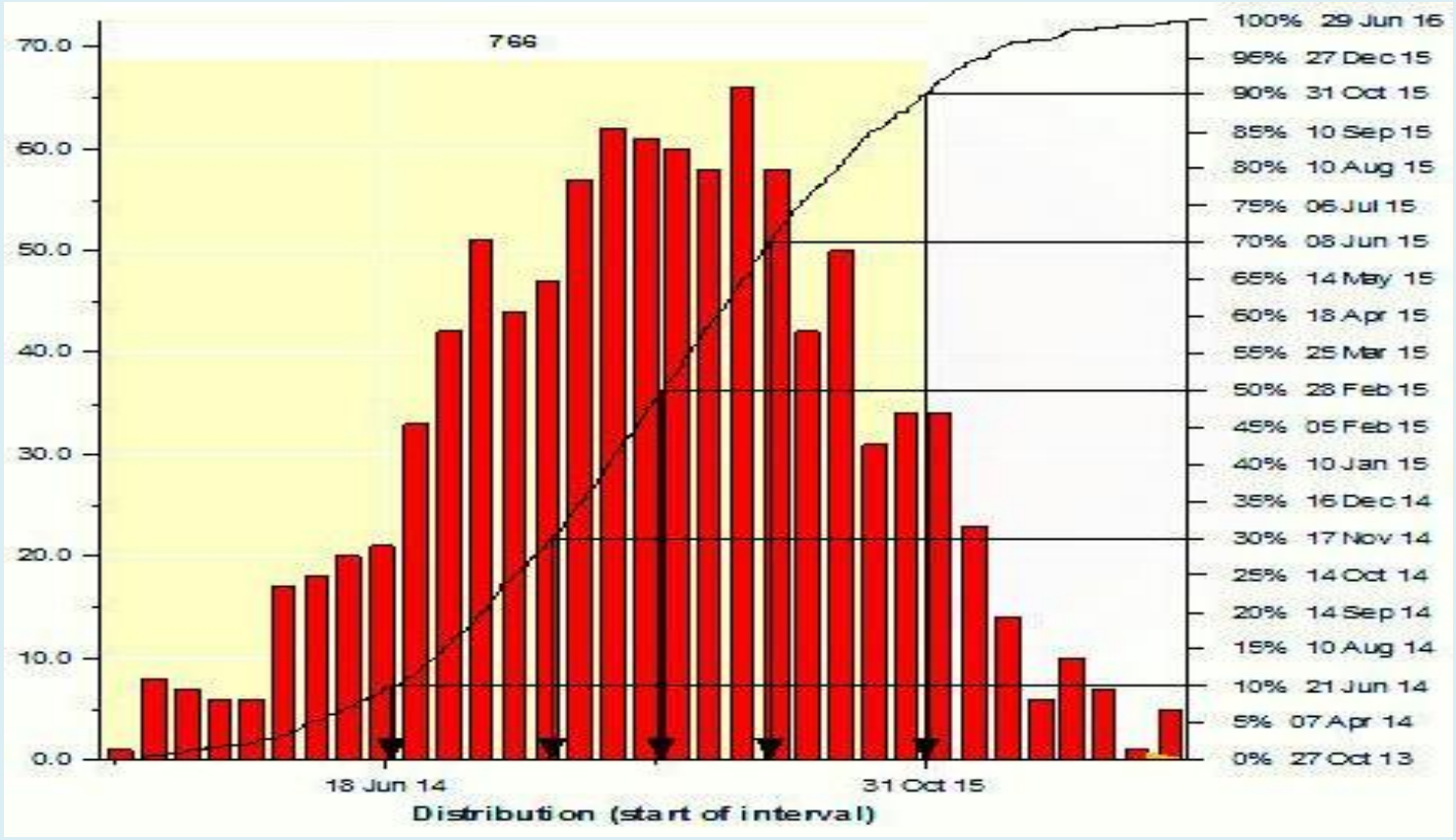


From the graph check the probability beside date 05, Jul 2015 = 75%
Correct answer is C.

Perform Quantitative Risk Analysis
Monte Carlo Questions

Q6) completion date 05/Feb/2015. **What is the average date to complete the project?**

A) 28 FEB 2015.
B) 18 APR 2015.
C) 10 JAN 2015
D) 14 MAY 2015.

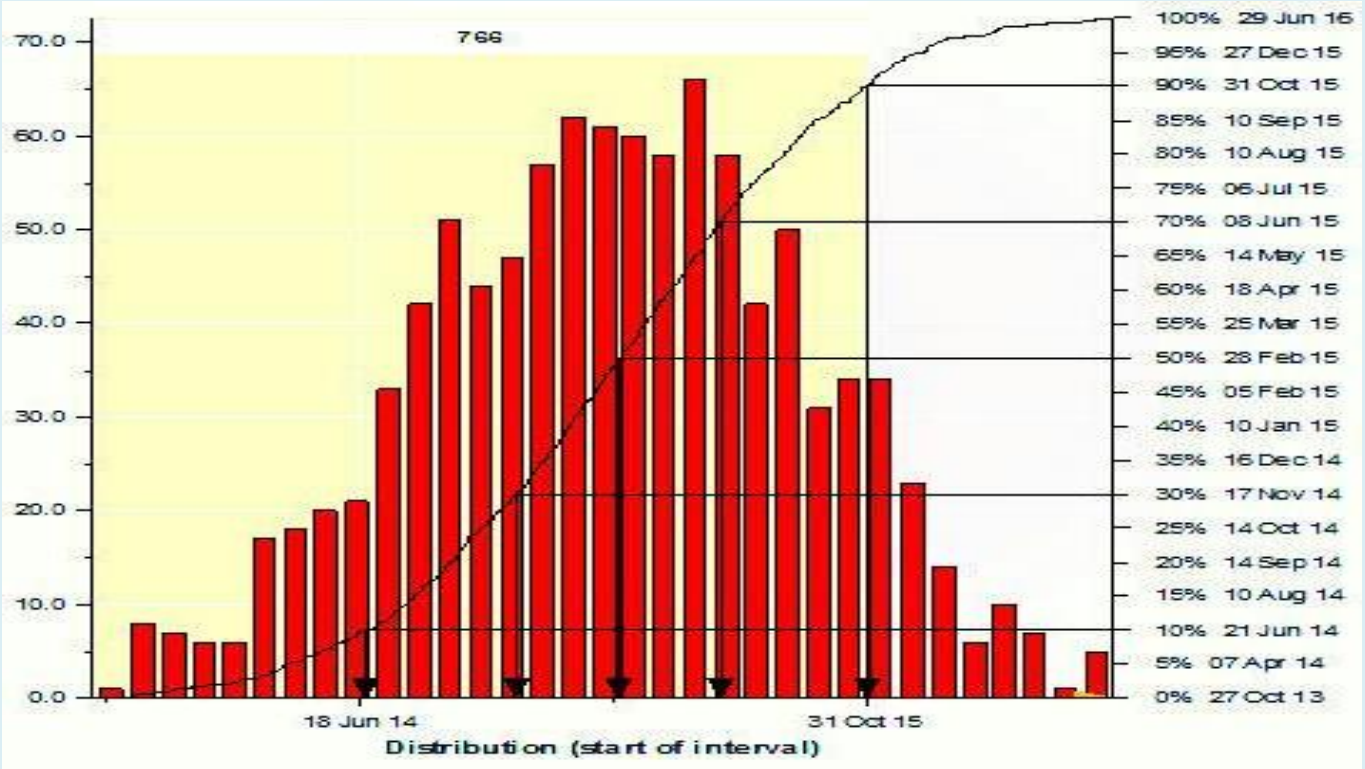


From the graph check the date beside probability 50% = 28, FEB 2015.
Correct answer is A.

Perform Quantitative Risk Analysis
Monte Carlo Questions

Q7) completion date 05/Feb/2015. **What is the Contingency reserve if the confidence level changed from P40 to P90?**

A) 7 Months and 2 days.
B) 8 Months and 13 days
C) 9 Months and 21 days
D) 3 Months and 17 days

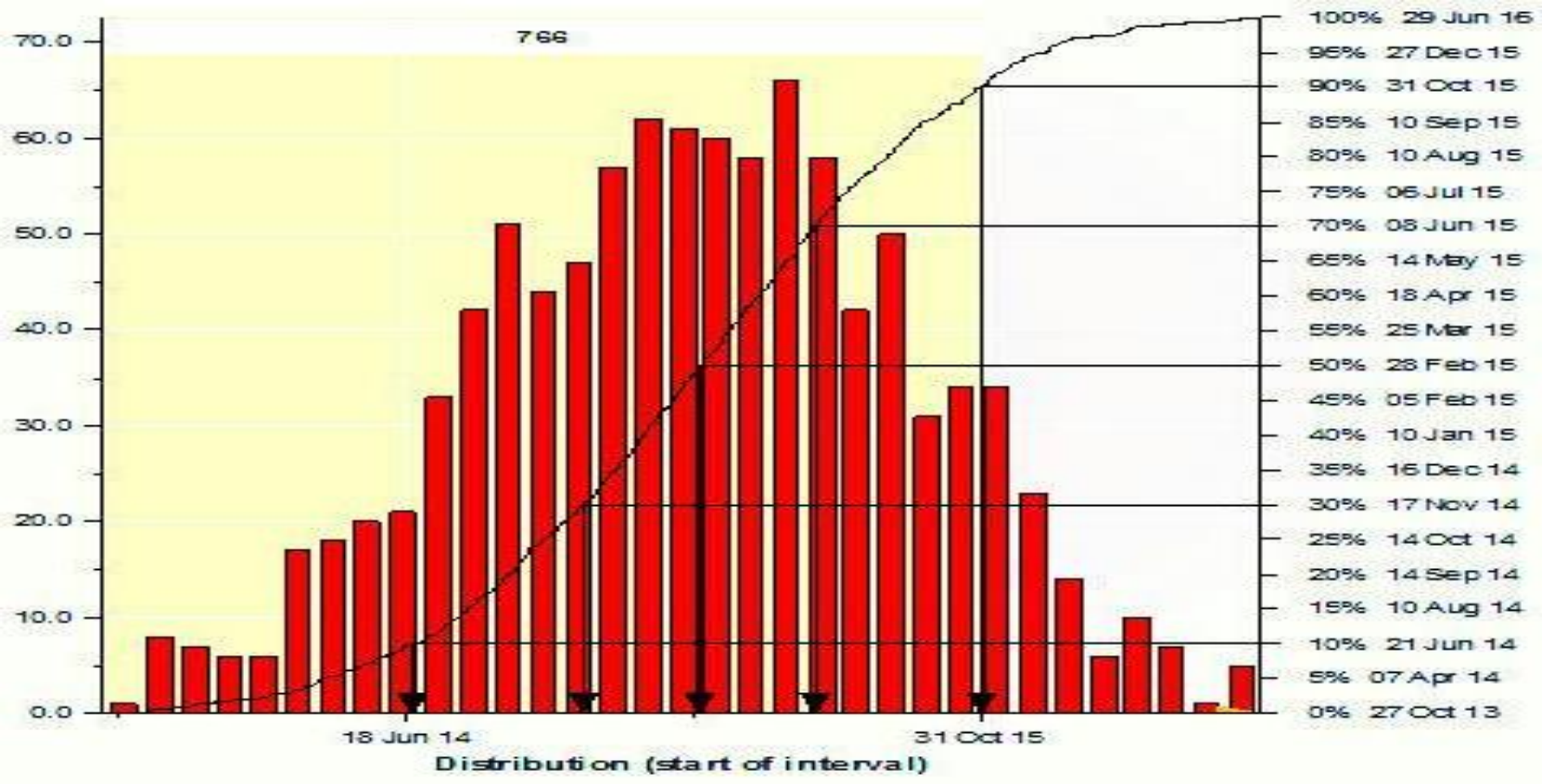


From the graph check the date beside probability 40% = 10, JAN 2015.
And beside 90% = 31, OCT 2015, then calculate the difference = 31,OCT 2015 – 10, JAN 2015 = 9 Months and 21 day.
Correct answer is C.

Perform Quantitative Risk Analysis
Monte Carlo Questions

Q8) completion date 05/Feb/2015. **What is the probability of achieving the planned completion date ?**

A) 40%.
B) 45%
C) 80%
D) 75%

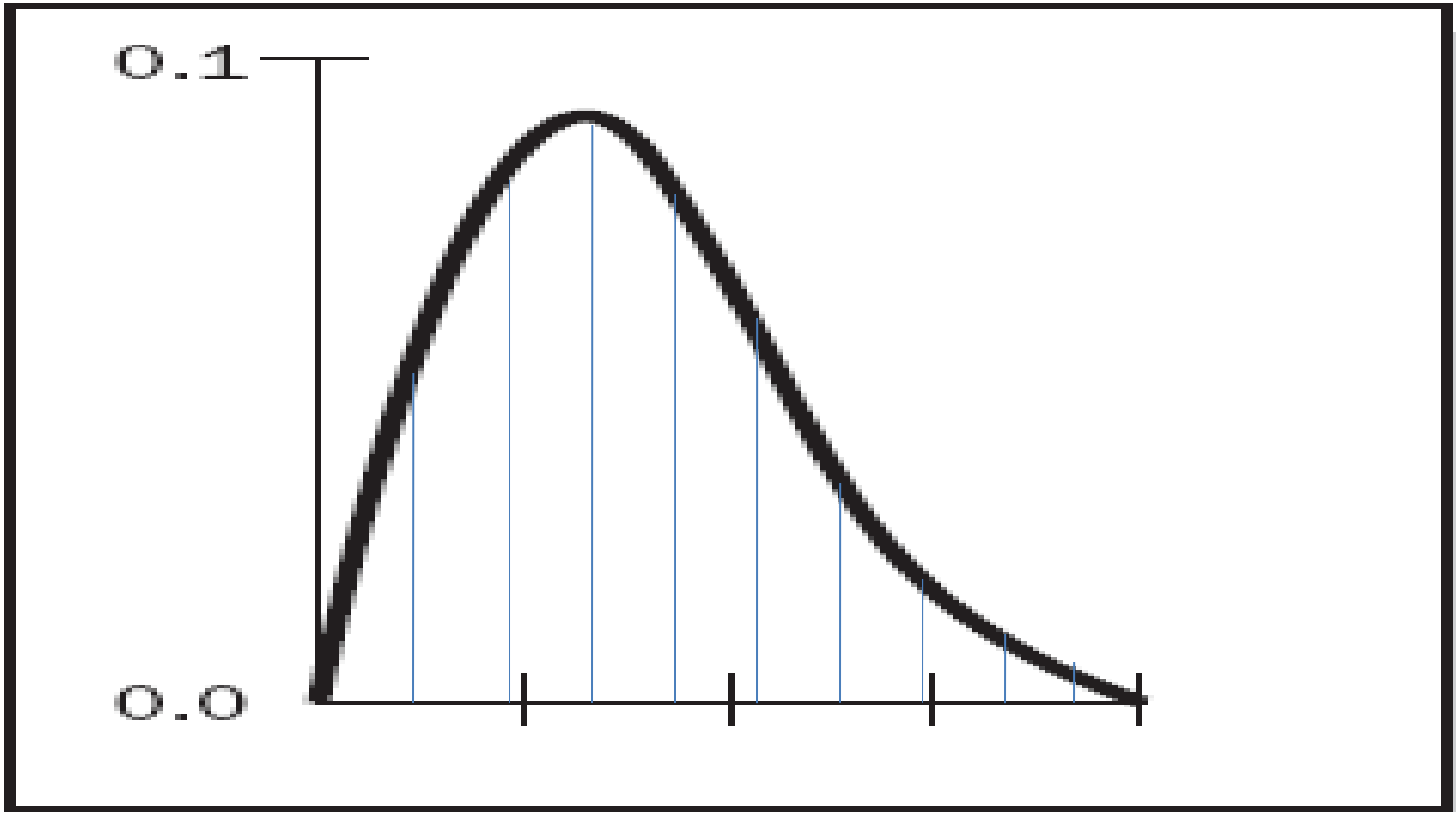


From the graph check the probability beside 05/FEB/2015 = 45%
Correct answer is B.

LESSON7. Perform Quantitative Risk Analysis
7.3.2 Tools and Techniques

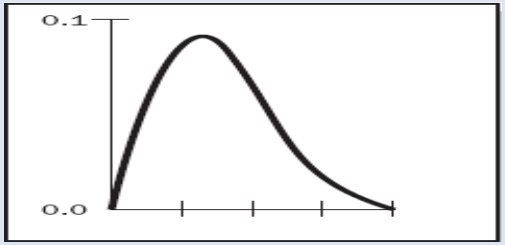
Monte Carlo Simulation Vs Latin Hyper-Cube

Probability Distribution



LESSON7. Perform Quantitative Risk Analysis
7.3.2 Tools and Techniques

Monte Carlo Simulation Vs Latin Hyper-Cube

item	Latin Hyper Cube Sampling (LHC)	Monte Carlo Simulation
Speed	Fast	Slow
Efficient	More Efficient	Less Efficient
Iterations	Less number of iterations	More number of iterations
Standard Division	small	big
Random draws	-Not entirely random it is a stratified sampling method. -Divide the distribution into equal intervals (STRATA) with equal probability and randomly draw from each interval.	Entirely random sampling technique 
Clustering	reduce clustering	Create clustering
Sampling Area	Insure that all portions in the distribution are sampled including the tails.	Most draws are closer to the mean, but the tails (areas of high uncertainty) are usually underrepresented in the sampling.

LESSON7. Perform Quantitative Risk Analysis
7.3.2 Tools and Techniques

2-4 Decision Tree Analysis

- Decision tree analysis is usually performed using specialized, but widely available software.

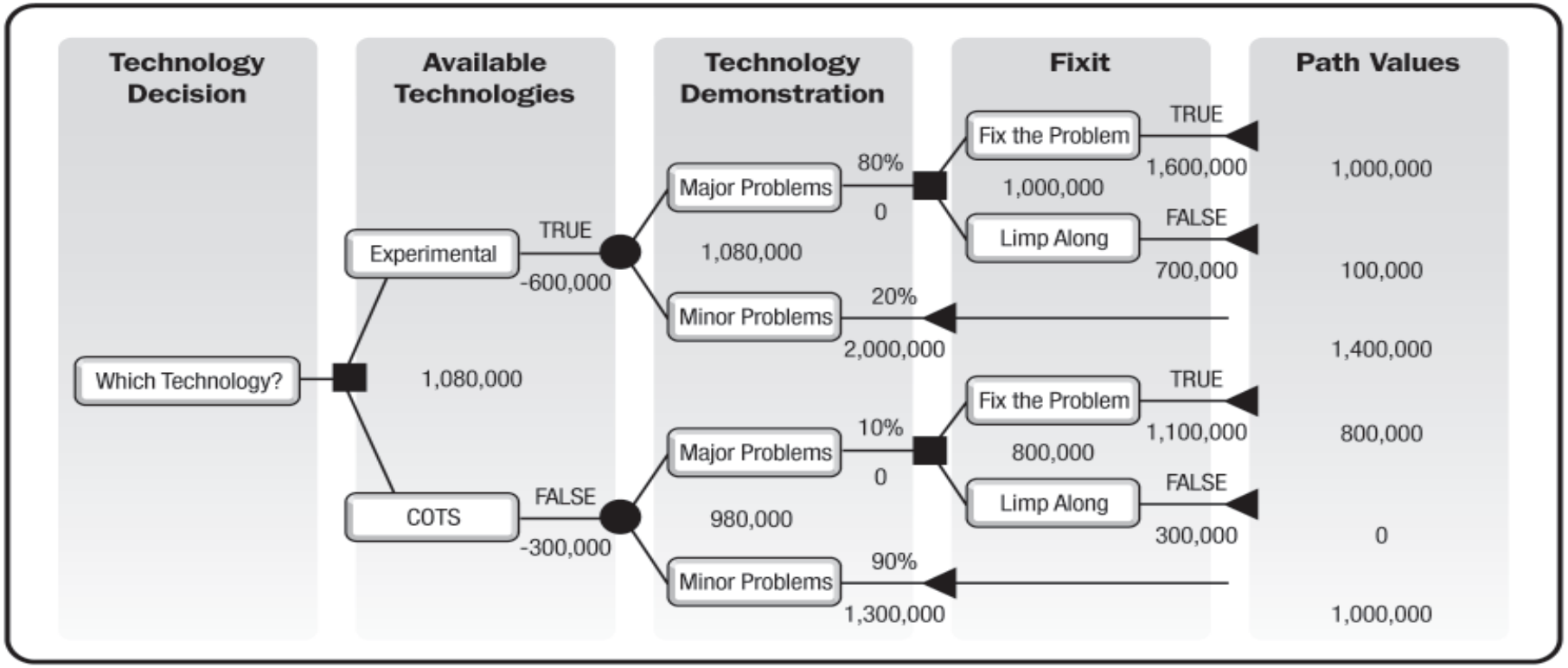
- The software allows the user to specify the structure of the tree with :
  - decision nodes.
  - Chance nodes.
  - Costs.
  - Benefits.
  - Probabilities.

- The user can also evaluate the different decisions using:
  - Linear utility functions based on Expected Monetary Value.
  - Non-linear utility functions.

LESSON7. Perform Quantitative Risk Analysis
7.3.2 Tools and Techniques

2-4 Decision Tree Analysis

- The negative numbers = outflows or investments (e.g. COTS).
- The percentages represent probabilities of the event occurring (Major Problems).
- The positive numbers = inflows values (after "Fix the Problem").
- "True" indicates the decision option taken from the square decision node.
- "False" indicates the decision option not taken.



LESSON7. Perform Quantitative Risk Analysis
7.3.2 Tools and Techniques

2-4 Decision Tree Analysis

Technique	Strengths	Weaknesses	CSFs
Decision Tree Analysis	• Causes the organization to structure the costs and benefits of decisions when the results are determined in part by uncertainty and risk • Solution of the decision tree helps select the decision that provides the highest Expected Monetary Value or expected utility to the organization	• It is sometimes difficult to create the decision structure • Probabilities of occurrences can be difficult to quantify in the absence of historical data • The best decision may change with relatively plausible changes in the input data, meaning that the answer may not be stable • The organization may not make decisions based on a linear Expected Monetary Value basis but rather on a non-linear utility function; utility functions are difficult to specify	• Careful structuring of the decision tree. All alternative decisions that are materially different should be considered; decision trees should be specified completely • Access to high-quality data about probability, cost and reward for the decisions and events specified using historical information or judgment of experts • Use of a utility function that has been validated with the organization's decision makers

LESSON7. Perform Quantitative Risk Analysis
7.3.2 Tools and Techniques

2-4 Decision Tree Analysis

Technique	Strengths	Weaknesses	CSFs
		• The organization may not make decisions based on a linear Expected Monetary Value basis but rather on a non-linear utility function. Utility functions are difficult to specify • Decision tree analysis of complicated situations requires specialized (though available) software • There may be some resistance to using technical approaches to decision-making	• Availability and understanding of the specialized software needed to structure and solve the decision tree

LESSON7. Perform Quantitative Risk Analysis
7.3.2 Tools and Techniques

2-5 Expert Judgment

- Expert judgment (ideally using experts with relevant, recent experience).
- Required to identify potential cost and schedule impacts, to evaluate probability, and to define inputs such as probability distributions into the tools.
- Expert judgment also comes into play in the interpretation of the data.
- Experts should be able to identify the weaknesses of the tools as well as their strengths.
- Experts may determine when a specific tool may or may not appropriate to organization's capabilities and culture.

LESSON7. Perform Quantitative Risk Analysis
7.3.2 Tools and Techniques

2-6 FMEA/Fault Tree Analysis

2-7 Post-project reviews/Lessons Learned/Historical Information

2-8 System Dynamics

LESSON 10
Questions

Contingency Reserve & EMV questions

Q1- You are a project manager of a new project for your organization FDR Inc. You and your team calculating the EMV for some risks. Reference to the risks in the below table What is the **Expected Monetary value (EMV)**?

A) - 74,100
B) - 170,460
C) 100,460
D) - 67,150.

Risk	Probability	Impact ($)
R1	0.6	-80,000
R2	0.5	+ 66,000
R3	0.4	-120,000
R4	0.66	+ 23,000
R5	0.73	-36,000

EMV = Sum (P x I) =
- 0.6 x80,000 + 0.5 x66.000 - 0.4 x 120,000 + 0.66 x 23,000 - 0.73 x 36,000 =
-74,100 $
Correct answer is A.

LESSON 10
Questions

Contingency Reserve questions

Q2- You are a project manager of a new project for your organization FDR Inc. You and your team calculating the contingency reserve for the project. Reference to the risks in the below table What is the **contingency reserve** of your project ?

A) 120000
B) - 170,460
C) 170,460
D) - 120000.

Risk	Probability	Impact ($)
R1	0.6	-80,000
R2	0.5	-66,000
R3	0.4	-120,000
R4	0.66	-23,000
R5	0.73	-36,000

Contingency reserve of the project = CR = EMV = Sum (P x I) =
- (0.6 x80,000 + 0.5 x66.000 + 0.4 x 120,000 + 0.66 x 23,000 + 0.73 x 36,000) = -170,460 .
So the contingency reserve of the project = CR =170,460.
Correct answer is C.

LESSON 10
Questions

Contingency Reserve questions

Q3- You are a project manager of a new project for your organization FDR Inc. You and your team calculating the contingency reserve for the project. Reference to the risks in the below table What is **the remaining contingency reserve** of your project **if R5 occurred?**

A) 144,180
B) 128,460
C) 170,460
D) 134,460

Risk	Probability	Impact ($)
R1	0.6	-80,000
R2	0.5	-66,000
R3	0.4	-120,000
R4	0.66	-23,000
R5	0.73	-36,000

Old Contingency reserve of the project = CR = EMV = Sum (P x I) =
- (0.6 x80,000 + 0.5 x66.000 + 0.4 x 120,000 + 0.66 x 23,000 + 0.73 x 36,000) =
-170,460 . So the old contingency reserve of the project = CR =170,460.
If the R5 occurred, we have to subtract its impact from the old CR of the project.
The remaining CR of the project = 170,460 - 36,000 = 134,460 $.
Correct answer is D.

LESSON 10
Questions

Contingency Reserve questions

Q4 - You are a project manager of a new project for your organization FDR Inc. You and your team calculating the contingency reserve for the project. Reference to the risks in the below table What is **the new contingency reserve** of your project **if the probability of R1 changed from 60% to 70%?**

A) 178,460
B) 128,460
C) 170,460
D) 185,460

Risk	Probability	Impact ($)
R1	0.6	-80,000
R2	0.5	-66,000
R3	0.4	-120,000
R4	0.66	-23,000
R5	0.73	-36,000

The new Contingency reserve of the project = CR = EMV = Sum (P x I) =
- (0.7 x80,000 + 0.5 x66.000 + 0.4 x 120,000 + 0.66 x 23,000 + 0.73 x 36,000) =
-178,460 .
So the new contingency reserve of the project = CR =178,460.

Correct answer is A.

LESSON 10
Questions

Contingency Reserve questions

Q5 - You are a project manager of a new project for your organization FDR Inc. You and your team calculating the contingency reserve for the project. Reference to the risks in the below table What is **the new contingency reserve** of your project **if R4 outdated (retired) ?**

A) 178,460
B) 155,280
C) 170,460
D) 147,460

Risk	Probability	Impact ($)
R1	0.6	-80,000
R2	0.5	-66,000
R3	0.4	-120,000
R4	0.66	-23,000
R5	0.73	-36,000

Old Contingency reserve of the project = CR = EMV = Sum (P x I) =
- (0.6 x80,000 + 0.5 x66.000 + 0.4 x 120,000 + 0.66 x 23,000 + 0.73 x 36,000) =
-170,460 . So the old contingency reserve of the project = CR =170,460.
If the risk retired you have to subtract its contingency reserve from the old CR of the project.
The new Contingency reserve of the project = 170,460 – (0.66 x 23,000) = 155,280.
Correct answer is B.

LESSON 10
Questions

Contingency Reserve questions

Q6 - You are a project manager of a new project for your organization FDR Inc. You and your team calculating the contingency reserve for the project. Reference to the risks in the below table What is **the new contingency reserve** of your project **if R2 outdated (retired) ?**

A) 333,330
B) 437,000
C) 367,000
D) 297,000

Risk	Probability	CR
R1	0.6	80,000
R2	0.5	70,000
R3	0.35	220,000
R4	0.55	28,000
R5	0.79	39,000

Old Contingency reserve of the project = CR = EMV = Sum (P x I)
= 80,000 + 70,000 + 220,000 + 28,000 + 39,000 = 437,000
If the risk retired you have to subtract its contingency reserve from the old CR of the project.
The new Contingency reserve of the project = 437,000 – 70,000 = 367,000.
Correct answer is C.

LESSON 10
Questions

Contingency Reserve questions

Q7 - You are a project manager of a new project for your organization FDR Inc. You and your team calculating the contingency reserve for the project. Reference to the risks in the below table What is **the new contingency reserve** of your project **if the probability of R3 changed from 35% to 50%?**

A) 700,330
B) 437,000
C) 447,000
D) 531,286

Risk	Probability	CR
R1	0.6	80,000
R2	0.5	70,000
R3	0.35	220,000
R4	0.55	28,000
R5	0.79	39,000

Old CR of R3 = 220,000 = 0.35 x I So I = 220,000/0.35 .
The new Contingency reserve of the project = CR = EMV = Sum (P x I).
= 80,000 + 70,000 + ((220,000 /0.35)x 0.5) + 28,000 + 39,000 = 531,286.

Correct answer is D.

LESSON 10
Questions

Contingency Reserve questions

Q8 - You are a project manager of a new project for your organization FDR Inc. You and your team calculating the contingency reserve for the project. Reference to the risks in the below table What is **the new contingency reserve** of your project **if R1 occurred ?**

A) 303,667
B) 357,000
C) 447,000
D) 531,286

Risk	Probability	CR
R1	0.6	80,000
R2	0.5	70,000
R3	0.35	220,000
R4	0.55	28,000
R5	0.79	39,000

CR of R1 = 80,000 = 0.60 x I So I = 80,000/0.60 = 133,333 .
Old Contingency reserve of the project = CR = EMV = Sum (P x I).
= 80,000 + 70,000 + 220,000 + 28,000 + 39,000 = 437,000.
If R1 occurred, we have to subtract its impact from the Old CR of the project.
The new CR = 437,000 – 133,333 = 303,667
Correct answer is A.

LESSON7. Perform Quantitative Risk Analysis
7.3.3 Tools and Techniques Characteristics

1- Comprehensive Risk Representation

- Risk models permit representation of many, if not all, of the risks that have impact on an objective simultaneously.
- They also permit the representation of both opportunities and threats to the project's objectives.

2- Risk Impact Calculation

Quantitative models facilitate the correct calculation of the effect of many risks, which are typically identified and quantified at a level of detail below the total project, on the project objectives.

LESSON7. Perform Quantitative Risk Analysis
7.3.3 Tools and Techniques Characteristics

3- Quantitative Method Appropriate to Analyzing Uncertainty

- Probability models use a quantitative method that addresses uncertainty.
- Handle the **uncertainty** which is represented as probability of an event's occurring or as probability distributions for a range of outcomes.
- Monte Carlo simulation tools that permit the combination of probability distributions of line-item costs or schedule activity durations, many of which are uncertain.

4- Data Gathering Tools

- Data gathering tools used in this process include assessment of historical data and workshops, interviews, or questionnaires to gather quantified information.
- Such as the probability of a risk occurring, a probability distribution of its potential impacts on cost or time, or relationships such as correlation between risks.

LESSON7. Perform Quantitative Risk Analysis
7.3.3 Tools and Techniques Characteristics

5- Effective Presentation of Quantitative Analysis Results

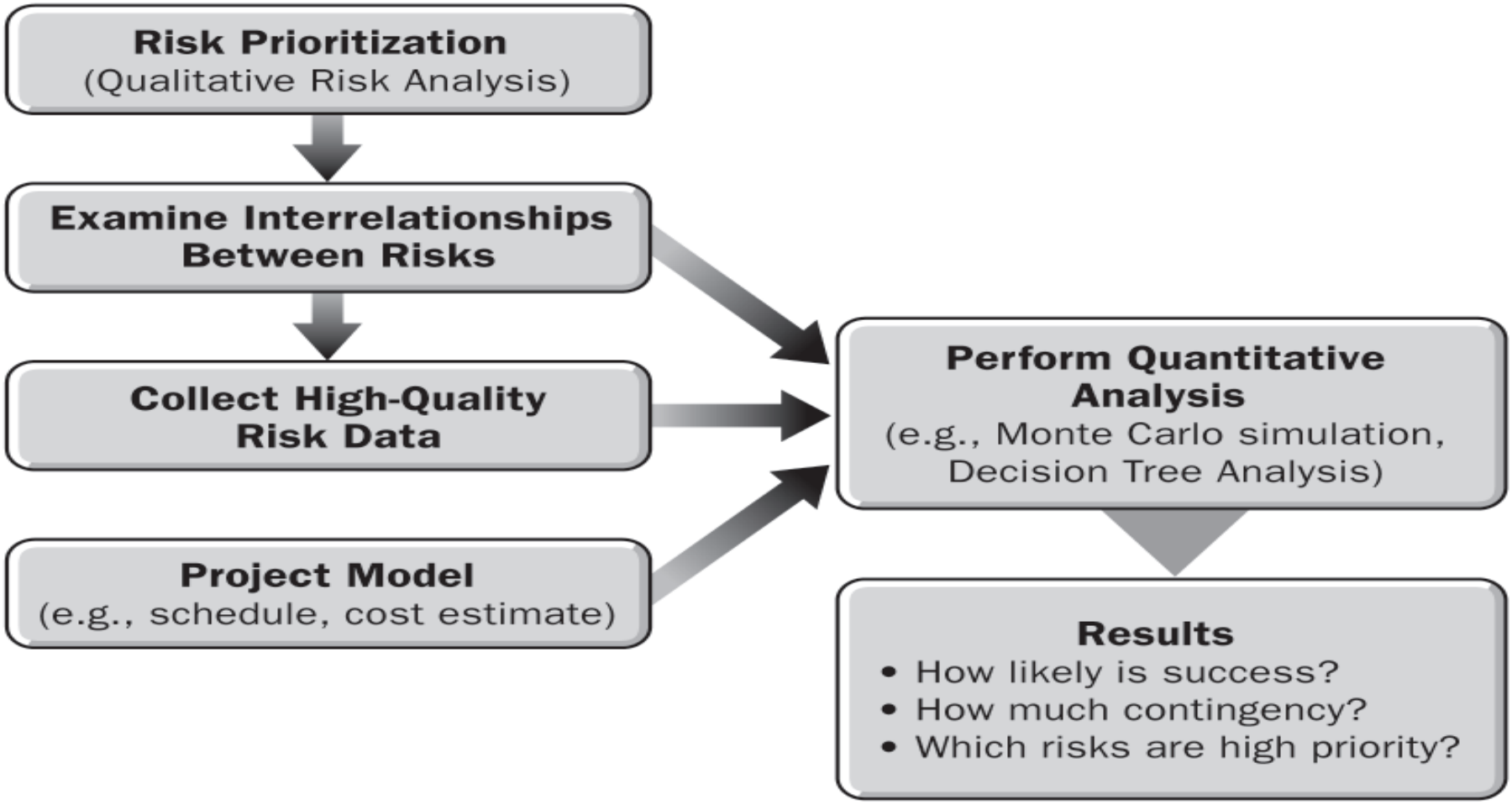
- Results from the quantitative tools are generally not available in standard **deterministic** project management methods such as project scheduling or cost estimating.

- These results, when all risks are considered simultaneously, include the following:
  - Probability of achieving a project objective such as finishing on time or within budget.
  - A mount of contingency reserve in cost, time, or resources needed to provide a required level of confidence.
  - Identity or location within the project model of the most important risks.
    - Sensitivity analysis in a cost risk analysis .
    - Criticality analysis in a schedule risk analysis.

LESSON7. Perform Quantitative Risk Analysis
7.3.3 Tools and Techniques Characteristics

5- Effective Presentation of Quantitative Analysis Results

Structure of a Quantitative Risk Analysis



LESSON7. Perform Quantitative Risk Analysis
7.3.3 Tools and Techniques Characteristics

6- Iterative Quantitative Risk Analysis

- The success of the Perform Quantitative Risk Analysis process is enhanced if the process is used periodically throughout the project.
- The frequency of this effort will be determined during the Plan Risk Management process but will also depend on events within the project itself

7- Information for Response Planning

- Overall project contingency reserve in time and cost should be reflected in the project's schedule and budget.
- Quantitative risk analysis provides information that may be used to modify the project plan.
- If the overall risk to time and cost indicates that an adjustment in scope is needed, the scope changes are agreed upon and documented and a new quantitative risk analysis is carried out to reflect the new aspects of the project.

LESSON7. Perform Quantitative Risk Analysis
7.3.4 Outputs

3-1 Project Documents Updates

Project documents are updated with information resulting from quantitative risk analysis. For example, risk register updates could include:

- **Probabilistic analysis of the project.**
- **Probability of achieving cost and time objectives.**
- **Prioritized list of quantified risks.**
- **Trends in quantitative risk analysis results.**

LESSON7. Perform Quantitative Risk Analysis
7.3.4 Outputs

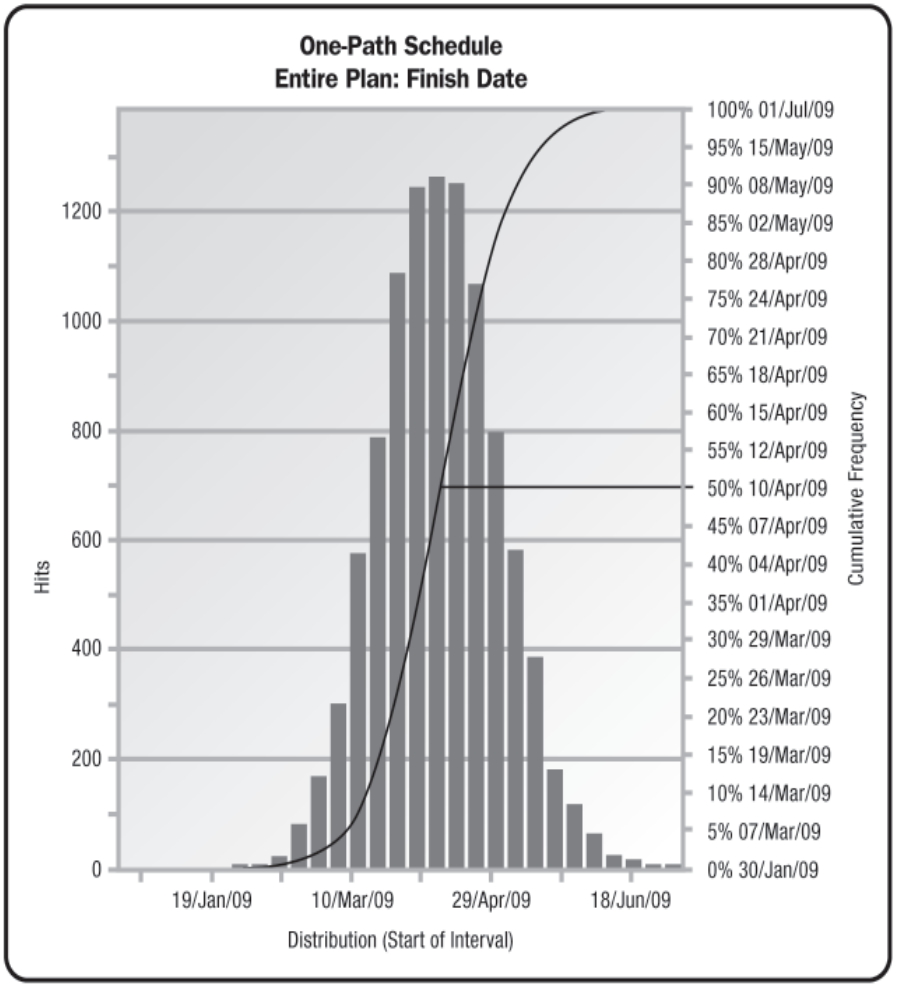
Risk register updates

- **Probabilistic analysis of the project.**

❑Listing the possible completion dates and costs with their associated confidence levels.

❑This output, often expressed as a cumulative frequency distribution, is used with stakeholder risk tolerances to permit quantification of the cost and time contingency reserves.

❑Contingency reserves are needed to bring the risk of overrunning stated project objectives to a level acceptable to the organization.

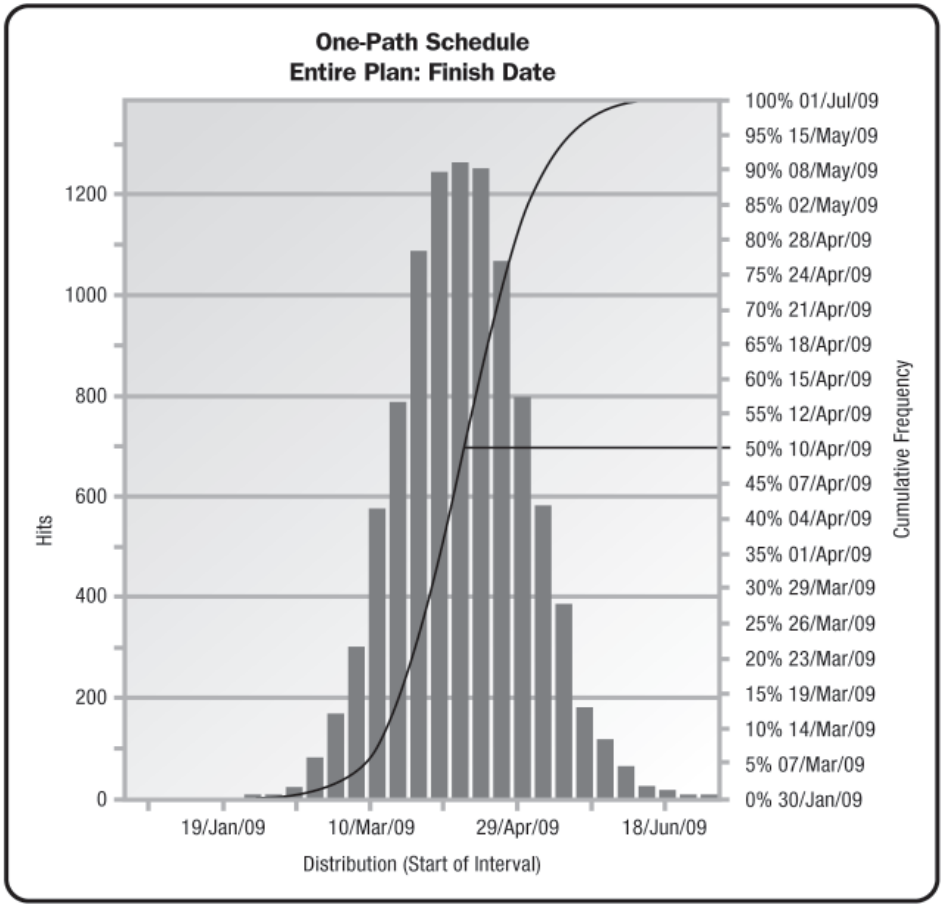


LESSON7. Perform Quantitative Risk Analysis
7.3.4 Outputs

Risk register updates

- **Probability of achieving cost and time objectives.**

With the risks facing the project, the probability of achieving project objectives under the current plan can be estimated using quantitative risk analysis results



LESSON7. Perform Quantitative Risk Analysis
7.3.4 Outputs

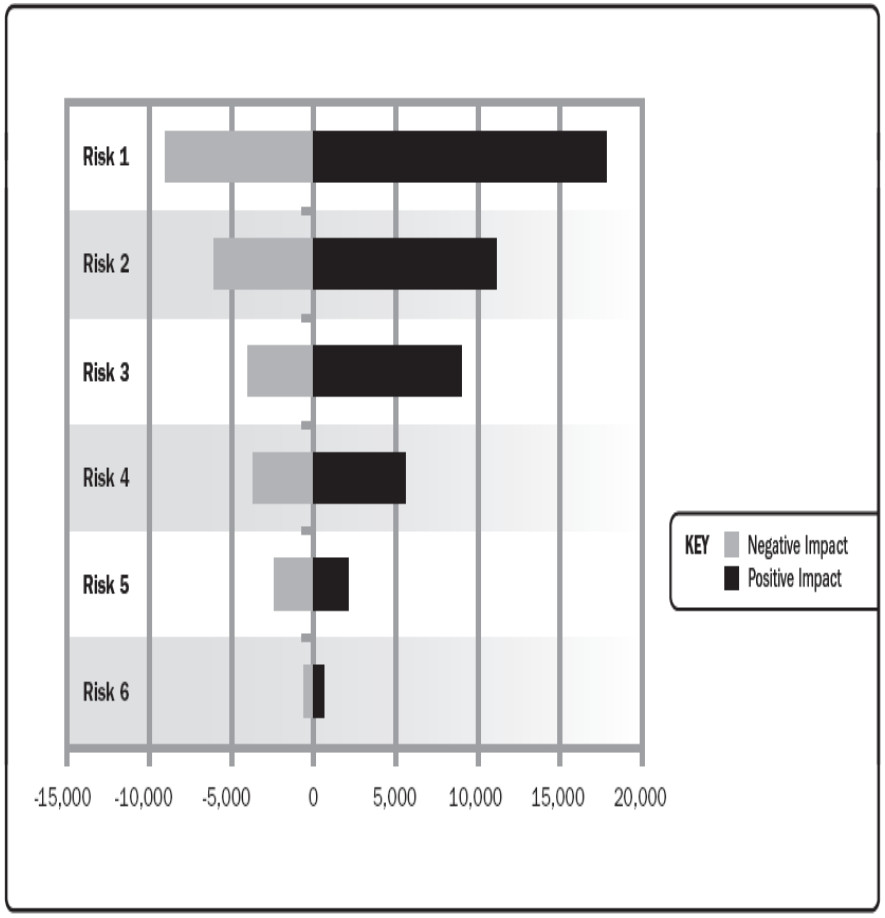
Risk register updates

❖ Prioritized list of quantified risks

❑This list includes those risks that pose the greatest threat or present the greatest opportunity to the project.

❑These include the risks that may have the greatest effect on cost contingency and those that are most likely to influence the critical path.

❑These risks may be evaluated, in some cases, through a tornado diagram generated as a result of the simulation analysis.



LESSON7. Perform Quantitative Risk Analysis
7.3.4 Outputs

Risk register updates

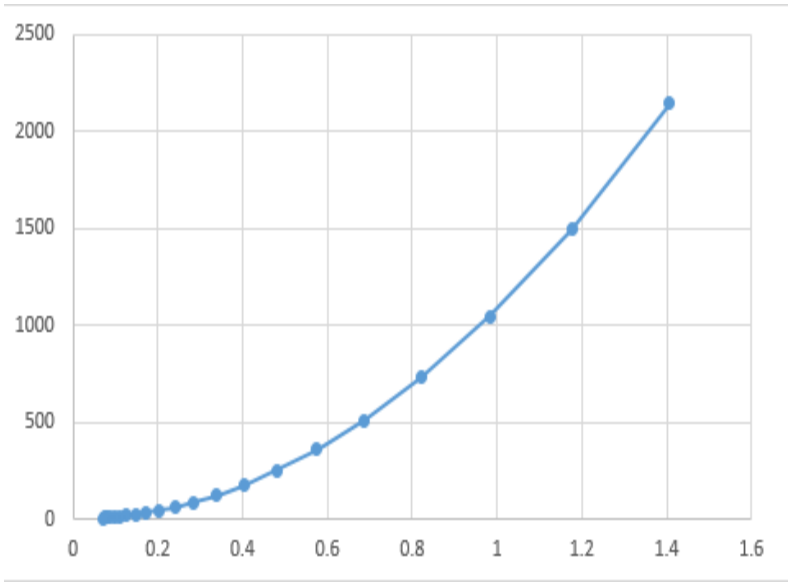
❖ Trends in quantitative risk analysis results

❑ As the analysis is repeated, a trend may become apparent that leads to conclusions affecting risk responses.

❑ Organizational historical information on project schedule, cost, quality, and performance should reflect new insights gained through the Perform Quantitative Risk Analysis process.

❑ Such history may take the form of a quantitative risk analysis report.

❑ separate from , or linked to, the risk register.



LESSON7. Perform Quantitative Risk Analysis
7.3.4 Outputs

Documenting the Results of the Perform Quantitative Risk Analysis Process

- The contingency reserves calculated in quantitative project cost and schedule risk analysis are incorporated, respectively, into the cost estimate and the schedule to establish a prudent target and a realistic expectation for the project.

- Contingency reserves may also be established to provide for the capture of opportunities that are judged to be priorities for the project.
  If the contingency reserve required exceeds the time or resources available, changes in the project scope and plan may result.

- Also, the results of the analysis may provide more or less urgency to risk response depending on the probability of achieving the plan's objectives or the amount of contingency reserve required to provide the necessary level of confidence.

- The results of a quantitative risk analysis are recorded and passed on to the person and/or group responsible for project management within the organization for any further actions required to make full use of these results.

LESSON7. Perform Quantitative Risk Analysis
7.3.4 Outputs

Risk register updates

RISK REGISTER																			
Risk Identification						Qulitative process									Quantitative Process				
Risk description	Causes	Effects	ROOT Cause	Potential Risk Response	Nominated Risk Owner	Probability	Impact	Ranking or scores	urgency	Category	Risk in watch list	Trend in qualitative risk results	Need further analysis	Need Response	Probabilistic analysis	Probability of completion date	Probability of total cost	Prioritized list of quantified risks	Trends in quantitative

RMP COACH

PROJECT RISK MANAGEMENT

Course

PMI-RMP

LESSON 8
Plan Risk Responses

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Domain 3: Risk Process Facilitation

Activities related to facilitating risk identification, evaluation, prioritization, and response among project team members.

Tasks	Risk Process Facilitation (25–28%)
Task 1	Apply risk assessment processes and tools in order to quantify stakeholder risk tolerances and determine risk levels.
Task 2	Facilitate risk identification using a variety of techniques in order to enable the project team and stakeholders to understand and determine the risk exposure of the project.
Task 3	Facilitate the project team's evaluation of the identified risks' attributes using qualitative and quantitative tools and techniques in order to prioritize the risks for response planning.
Task 4	Facilitate the development of an aligned risk response strategy and related risk actions by risk owners from the information gathered during risk analysis in order to ensure timely and defined action when required.

Domain 3: Risk Process Facilitation

Tasks	Risk Process Facilitation (25–28%)
Task 5	Facilitate the formulation of project contingency reserve based on the risk exposure of the project in order to have the capability and resources to respond to realized risks.
Task 6	Provide risk data to cost and schedule analysts/estimators to ensure that project risk is properly reflected in cost and schedule estimates for the project.
Task 7	Use scenarios to validate potential risk responses and evaluate key dependencies and requirements in order to enhance the likelihood of project success.

LESSON 8. Plan Risk Responses
Introduction

Plan Risk Responses:

Process of developing options and actions to enhance opportunities and to reduce threats to project objectives.

The key benefit of this process:

Addresses the risks by their priority, inserting resources and activities into the budget, schedule and project management plan as needed

Question

Which one of the sources of information include the roles and responsibilities to start plan risk responses processes?

A. Stakeholder register
B. Stakeholder Engagement plan
C. Risk register
D. Risk Management plan

Correct answer is D:
The risk management plan contains the roles and responsibilities

LESSON 8. Plan Risk Responses
Introduction

- The Plan Risk Responses process follows the Perform Quantitative Risk Analysis process (if used).

- Each risk response requires an understanding of the **mechanism** by which:-
  - Address the risk.
  - Analyze if the risk response plan is having the desired effect.
  - It includes the identification and assignment of one person (an risk action owner for risk response) to take responsibility for each **agreed-to and funded risk response.**

- Risk responses should be:
  - Appropriate for the significance of the risk.
  - Cost-effective in meeting the challenge.
  - Realistic within the project context.
  - Agreed upon by all parties involved.
  - Owned by a responsible person.

LESSON 8. Plan Risk Responses
Introduction

- Selecting the optimum risk response from several options is often required.

- The Plan Risk Responses process Presents commonly used approaches to planning responses to the risks.

- Risks include threats and opportunities that can affect project success, and responses are discussed for each.

LESSON 8. Plan Risk Responses
8.1 Purpose and Objectives

- Determine the set of actions which most enhance the chances of project success while complying with applicable **organizational and project** constraints.

- Once risks have been identified, analyzed, and prioritized, plans should be developed for addressing every risk the project team considers to be sufficiently important for threats and opportunities.

- **The planning entails agreeing upon:**
  - **The actions to be taken.**
  - **The potential changes to budget, schedule, resources, and scope which these actions might cause.**

- **Contingent risk response** actions need to be executed at the **optimum time**. For this reason, the response specification for each such risk should include a description of any corresponding **trigger conditions.**

Question

You have just finished a round of risk analysis with the project team, And you have identified a prioritized list of threats that pose the greatest impact to the project. Which is the best answer for what you just finished performing?
A- Qualitative risk analysis
B- Risk management planning
C- Risk response planning
D- Quantitative risk analysis

Correct answer is D:
As per the outputs of quantitative process pmbok5 ch11.

LESSON 8. Plan Risk Responses
8.1 Purpose and Objectives

Risk Owner and Risk Action Owner

- The responsibility for monitoring the project conditions and implementing the corresponding actions should be clearly assigned.
- Every risk should have been allocated to a **risk owner as part of the Identify Risks process**, and each of the **corresponding risk responses now be assigned to a specific risk action owner.**
- The key roles for Project Risk Management are those of risk owner and risk action owner.
- Role of the risk owner and that of the risk action owner may be assigned to a single person.

LESSON 8. Plan Risk Responses
8.1 Purpose and Objectives

Risk Owner VS Risk Action Owner

RISK OWNER	RISK ACTION OWNER(Response Owner)
A single risk owner should be assigned to every identified risk. (During identify risk process)	Each agreed-upon risk response should have a single risk action owner. (During plan risk responses process)
Manage the corresponding risk through all the subsequent Project Risk Management processes.	Reports periodically to the project manager on the effectiveness of the plan, any unanticipated effects, and any correction needed to handle the risk appropriately.
Select a suitable strategy for each individual risk based on its characteristics and assessed priority.	Ensuring that the agreed-upon risk responses are carried out as planned, in a timely manner.
Ensuring that the strategy is achievable, affordable, cost effective, and appropriate.	Take agreed-upon actions as required.
Defining actions to implement the chosen strategy. These actions may be delegated to action owners as appropriate.	Provide the risk owners with relevant information on status or changes to the risk characteristics.
Monitor actions to determine their effectiveness, and to identify any secondary risks which may arise because of the implementation of risk responses.	Monitor the trigger conditions and ensure that the corresponding actions are carried out as defined, in a timely manner.
Ensuring that the risk response is effective and for planning additional risk responses if required.	
Assess the effectiveness of any actions, decide whether additional actions are required, and keep the project manager informed of the situation.	
Risk owner may choose to assemble a team to develop a response.	

LESSON 8. Plan Risk Responses
8.1 Purpose and Objectives

Secondary Risk and Residual Risk

- **Secondary risk** arise as a direct result of implementing a risk response.
- **Secondary risks** have to be analyzed and planned for in the same way as those risks which were initially identified.

- **Residual risks** that will remain after the responses have been implemented.
- **Residual risks** should be clearly identified, analyzed, documented, and communicated to all relevant stakeholders.

LESSON 8. Plan Risk Responses
8.1 Purpose and Objectives

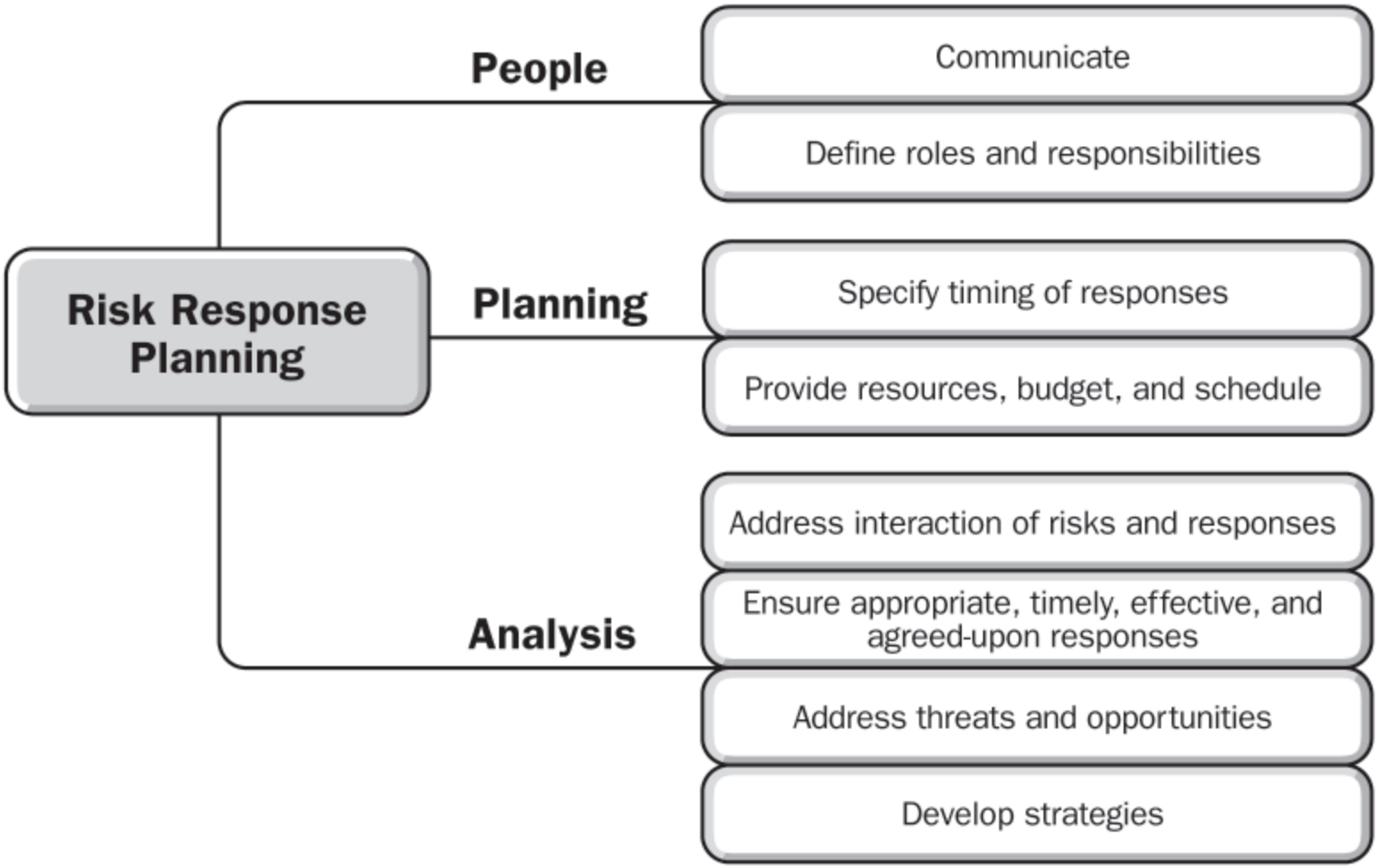
- All the approved, unconditional actions arising from risk response planning should be integrated into the project management plan in order to ensure that they are carried out as part of normal project implementation.
  - ✓ The corresponding organizational and project management rules should also be invoked, including the following:
    - Project change management and configuration control;
    - Project planning, budgeting, and scheduling;
    - Resource management; and
    - Project communication planning.

- It is never feasible or even desirable to eliminate all threats from a project.

- there is a limit to the extent to which opportunities can be proactively managed.

LESSON 8. Plan Risk Responses
8.2 Critical Success Factors

A range of factors are important for the success of the Plan Risk Responses process.



1- Communicate

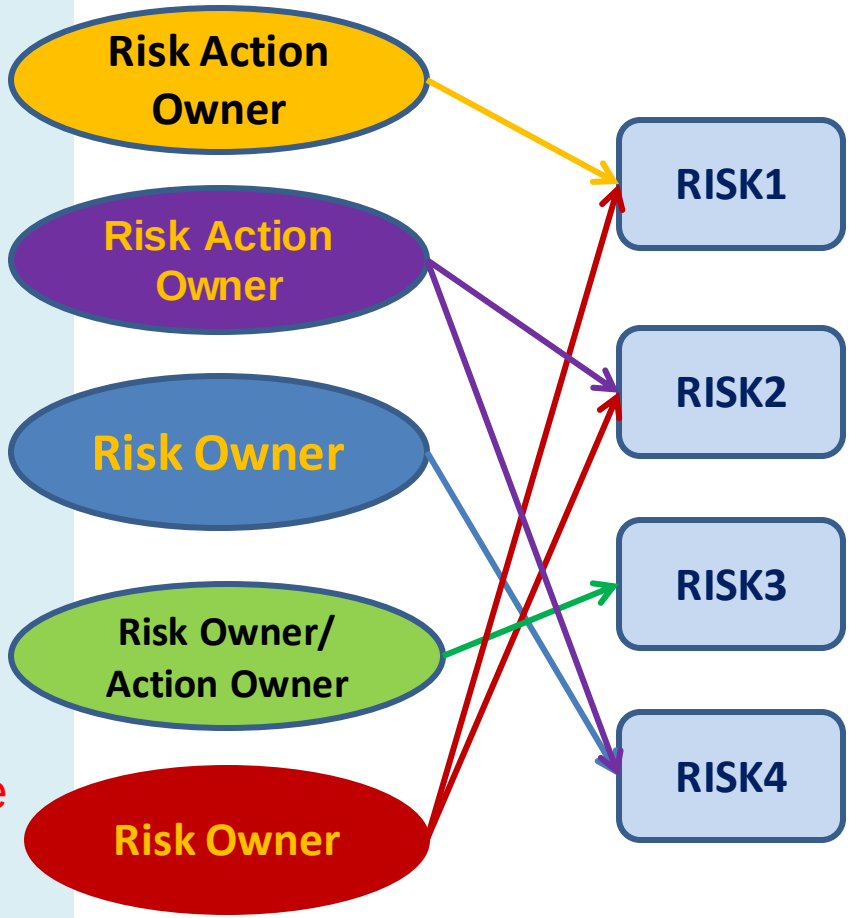
- Communication with the various stakeholders should be maintained in an open and appropriate manner.
- The plans are disseminated, and approval obtained in order to ensure full acceptance by all stakeholders.
- If organizational causes of risks, such as culture, attitudes, or disagreements concerning objectives are present, they should be addressed openly.

  Require involving high levels of the organization's management and other stakeholders.

OPEN AND APPROPRIATE

2- Clearly Define Risk-Related Roles and Responsibilities

- The risk **response success** will be dependent upon the **full support and involvement of the project team and other stakeholders.**
- The **key roles** for Project Risk Management
  - **Risk owner**
  - **Risk action owner.**
- A single risk owner should be assigned to every identified risk.
- Each agreed-upon and funded risk response should have a single risk action owner.



2- Clearly Define Risk-Related Roles and Responsibilities cond.

- The responsible people **should be aware of what is expected of them**, and other project stakeholders should understand and accept the needs and authority of these roles.

- Management may take ownership of risks with **political, organizational causes,** senior management should approve and track associated risk-related contingency reserves.

3- Specify Timing of Risk Responses

❑ **Agreed-upon responses** should be integrated into the **project management plan** and will therefore be scheduled and assigned for execution.

❑ **The responses that depend on uncertain conditions** should also be monitored to be performed if the conditions warrant them.

LESSON 8. Plan Risk Responses
8.2 Critical Success Factors

4- Provide Resources, Budget, and Schedule for Responses

- Each response should be planned in detail and integrated into the project management plan.
- Estimating the resources, costs, and duration, then updating the budget and schedule.
- Obtaining approval from management.
- Obtaining commitment from the risk owners and risk action owners.
- Management's role at this stage is vital for supporting the project manager in developing risk responses and authorizing the corresponding resources.

LESSON 8. Plan Risk Responses
8.2 Critical Success Factors

5- Address the Interaction of Risks and Responses

- Responses may be developed to address risks related by
  - Cause and effect .
  - Common root cause.

- **Categorization of risks**, may help identify and address this situation by:
  - **Risk breakdown structure.**
  - **Affinity diagram.**
  - **Other categorizing tools**

- Risks aggregated during the Perform Quantitative Risk Analysis should be considered (e.g., ten small, related risks combined may pose a big risk to the project), then develop generic responses where possible.

- Another interaction effect that may occur is when one risk, if it occurs, may affect the probability or impact of other risks.

5- Address the Interaction of Risks and Responses

- Deciding on the response strategy may require a compromise, since some proposed responses may be mutually exclusive or counterproductive.
  - For example mitigating a threat to time could cost money, thereby increasing pressure on the budget.
- Risk response planning also needs to take a holistic view of all proposed responses and make sure they are coherent.
- Planning responses to risks need to control the potential effects of the strategy developed for treating the original risk.
  - If the Control is overlooked, the total level of Threat in a project can increase, and potential for opportunities can be decreased.

6- Ensure Appropriate, Timely, Effective, and Agreed-Upon Responses

❑ Responses should be **appropriate, timely, cost-effective, feasible, achievable, agreed-upon, assigned, and accepted.**

❑ **Any proposed risk response plan needs to be assessed against the following criteria:**

- Consistency with organizational values, project objectives, and stakeholder expectations.
- Technical feasibility.
- Ability of the project team or risk action owners outside the project to carry out the corresponding actions.
- Balance between overall impact of the response on the project objectives and improvement in the risk profile of the project.

- Appropriate
- Timely
- cost-effective
- Feasible
- Achievable
- agreed-upon
- Assigned
- accepted

7- Address Both Threats and Opportunities

- Risk response planning should combine responses that address the threats as well as opportunities into a single, integrated plan.
- If either threats or opportunities are not fully addressed, the combined set of response strategies will be incomplete and may even be invalid.

Address Threats And Opportunities

LESSON 8. Plan Risk Responses
8.2 Critical Success Factors

8- Develop Strategies before Tactical Responses

- Risk response planning should be carried out in an open-minded manner rather than adopting the first response that seems to be feasible.
- The responses should be planned at a general, strategic level and the strategy validated and agreed upon, prior to developing the detailed tactical approach.
- Once the responses have been planned at a strategic level, they should be expanded into actions at the tactical level and integrated into the project management plan (e.g., schedule, budget, and resource assignments).
- This activity may generate additional secondary risks, which will need to be addressed at this time.

Response Planning in Open-minded Manner At **General Strategy Level**

↓

Validate Strategy

↓

Agreed Upon Strategy

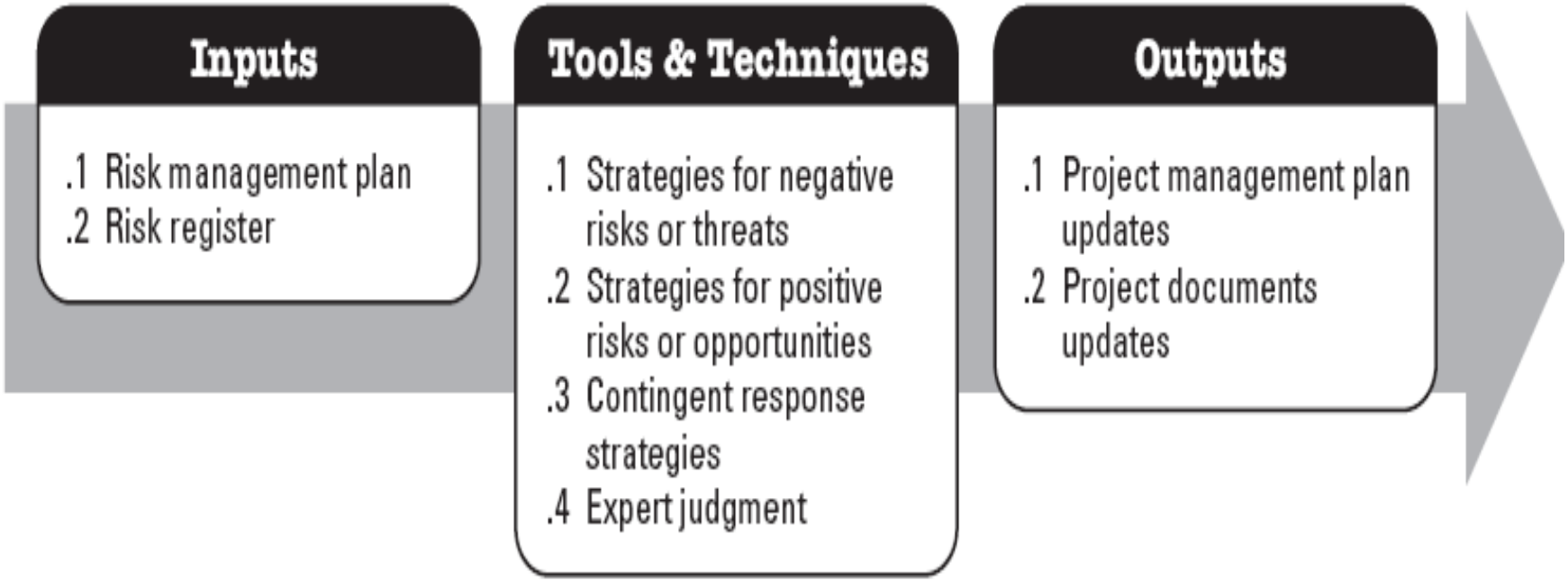
↓

Expanded Into Actions At The **Tactical Level**

↓

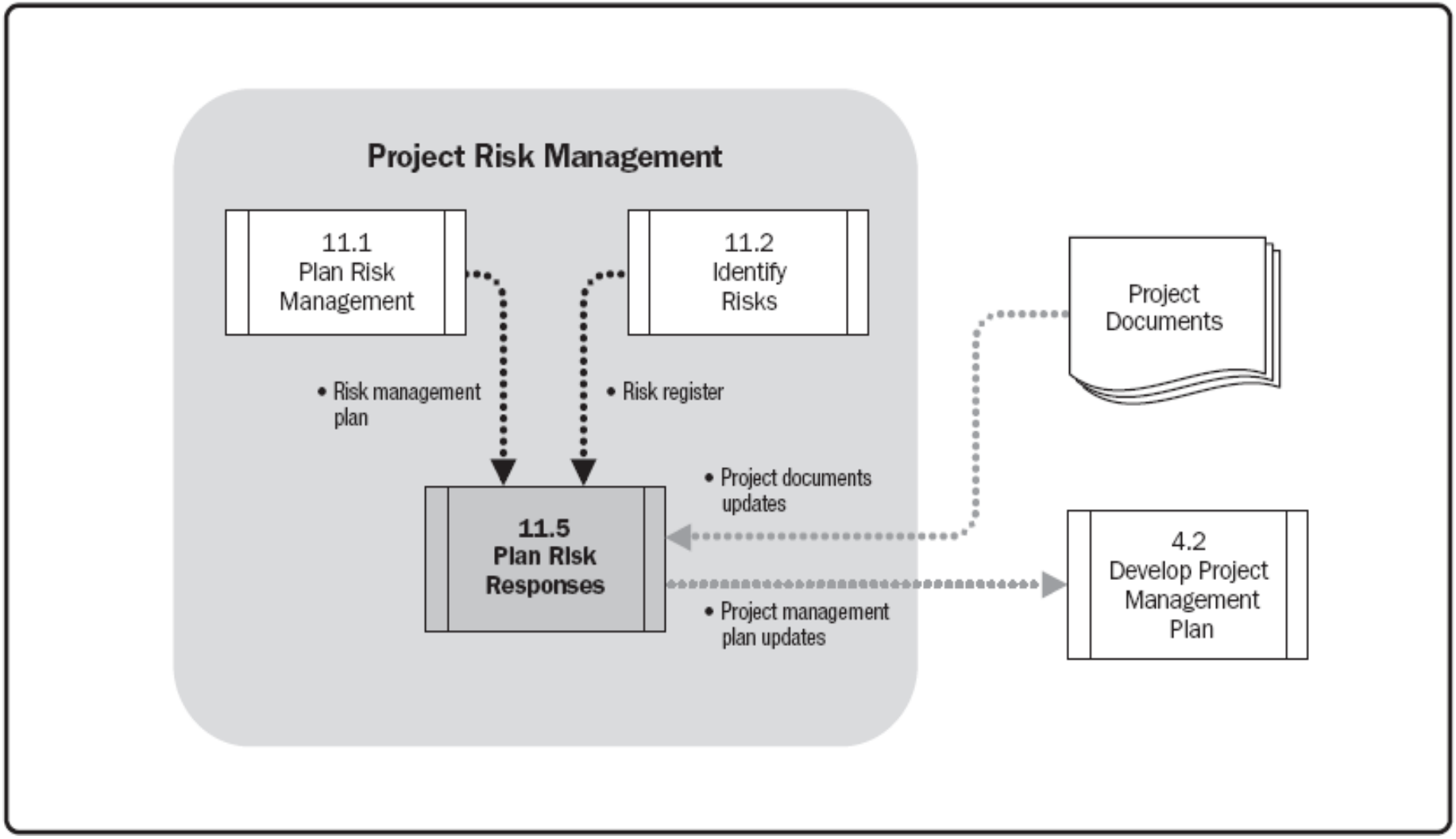
Detailed Tactical Approach **Integrated In Project Plan**

Inputs, Tools & Techniques, and Outputs



LESSON 8. Plan Risk Responses
8.3 Inputs, Tools & Techniques, and Outputs

Plan Risk Responses Data Flow Diagram



LESSON 8. Plan Risk Responses
8.3.1 Inputs

1- Risk Management Plan

- include roles and responsibilities, risk analysis definitions, timing for reviews and risk thresholds for low, moderate, and high risks.
- Risk thresholds help identify those risks for which specific responses are needed.

Risk Management Plan includes	
1- Methodology	6- Definitions of risk probability& impact
2- Roles and responsibilities.	7- Probability and Impact Matrix
3- Budgeting	8- Revised stakeholders' tolerances
4- Timing.	9- Reporting formats
5- Risk categories	10- Tracking

LESSON 8. Plan Risk Responses
8.3.1 Inputs

2- Risk Register

RISK REGISTER

Risk Identification						Qulitative process									Quantitative Process				
Risk description	Causes	Effects	ROOT Cause	Potential Risk Response	Nominated Risk Owner	Probability	Impact	Ranking or scores	urgency	Category	Risk in watch list	Trend in qualitative risk results	Need further analysis	Need Response	Probabilistic analysis	Probability of completion date	Probability of total cost	Prioritized list of quantified risks	Trends in quantitative

LESSON 8. Plan Risk Responses
8.3.2 Tools and Techniques

- Risk response strategies for individual risks, sets of risks, and project level risks.
- The strategy or mix of strategies most likely to be effective should be selected for each risk.
- **Decision tree analysis** can be used to choose the most appropriate responses. Specific actions are developed to implement that strategy, including primary and backup strategies, as necessary.
- The affected stakeholders should be involved in determining the strategies.
- Once the strategies have been selected, they need to be agreed upon by the entity that approves those strategies.

LESSON 8. Plan Risk Responses
8.3.2 Tools and Techniques

- **A fallback plan**
  can be developed for implementation if:
  - the selected strategy turns out not to be fully effective.
  - If identified risk with plan occurred.
  - If the contingent plan of actively accepted risk failed.

- **Secondary risks**
  Risks that arise as a direct result of implementing a risk response.

- **A contingency reserve**
  Often allocated for time or cost. If developed, it may include identification of the **conditions that trigger** its use.

LESSON 8. Plan Risk Responses
8.3.2 Tools and Techniques

1- Strategies for Negative Risks or Threats

- Three strategies, for threats: avoid, transfer, and mitigate. The fourth strategy, accept, can be used for threats or opportunities.
- Each of these risk response strategies have varied and unique influence on the risk.
- These strategies should be chosen to match the risk's probability and impact on the project's overall objectives.
- Avoidance and mitigation strategies are good strategies for critical risks with high impact,
- Transference and acceptance are good for threats that are less critical and with low overall impact.

LESSON 8. Plan Risk Responses
8.3.2 Tools and Techniques

1.1- Avoid

- Eliminate the threat or protect the project from its impact.
- Usually changing the project management plan to eliminate the threat entirely, Isolate project objectives from the risk's impact or change the objective that is in jeopardy.
- Examples:
  - Extending the schedule.
  - Changing the strategy.
  - Reducing scope.
  - Shut down the project entirely.
- Some risks that arise early in the project can be avoided by clarifying requirements, obtaining information, improving communication, or acquiring expertise.

LESSON 8. Plan Risk Responses
8.3.2 Tools and Techniques

1.2- Transfer

- Shifting the impact of a threat to a third party, together with ownership and responsibility for its management of the response. it does not eliminate it.
- Transferring does not mean disowning the risk by transferring it to a later project or another person without his or her knowledge or agreement.
- Transfer nearly always involves payment of a risk premium to the party taking on the risk.

LESSON 8. Plan Risk Responses
8.3.2 Tools and Techniques

1.2- Transfer

- Transferring liability for risk is most effective in dealing with financial risk exposure.
- Examples
  - Insurance.
  - Performance bonds.
  - Warranties.
  - Guarantees.
  - Contracts or agreements
    - Cost-plus contract may transfer the cost risk to the buyer.
    - Fixed-price contract may transfer risk to the seller.
- When a buyer has capabilities that the seller does not has, some work and its concurrent risk contractually back to the buyer.

LESSON 8. Plan Risk Responses
8.3.2 Tools and Techniques

1.3- Mitigate

- By reducing the probability and/or impact of an adverse risk to be within acceptable threshold limits.
- Taking early action to mitigate the risk is more effective than trying to repair the damage after the risk has occurred.
  - Adopting less complex processes.
  - Conducting more tests.
  - Choosing a more stable supplier.
  - Prototype development.
- If it is not possible to reduce probability, a mitigation might address the risk impact reduce the impact from a failure of the original component(**Redundancy into a system**).

LESSON 8. Plan Risk Responses
8.3.2 Tools and Techniques

1.4 - Accept.

Project team decides to acknowledge the risk and not take any action unless the risk occurs.

Adopted When:

- Not possible or cost-effective to address a specific risk in any other way.
- Project team has decided not to change the project management plan to deal with a risk.
- Unable to identify any other suitable response strategy.

LESSON 8. Plan Risk Responses
8.3.2 Tools and Techniques

1.4 - Accept.

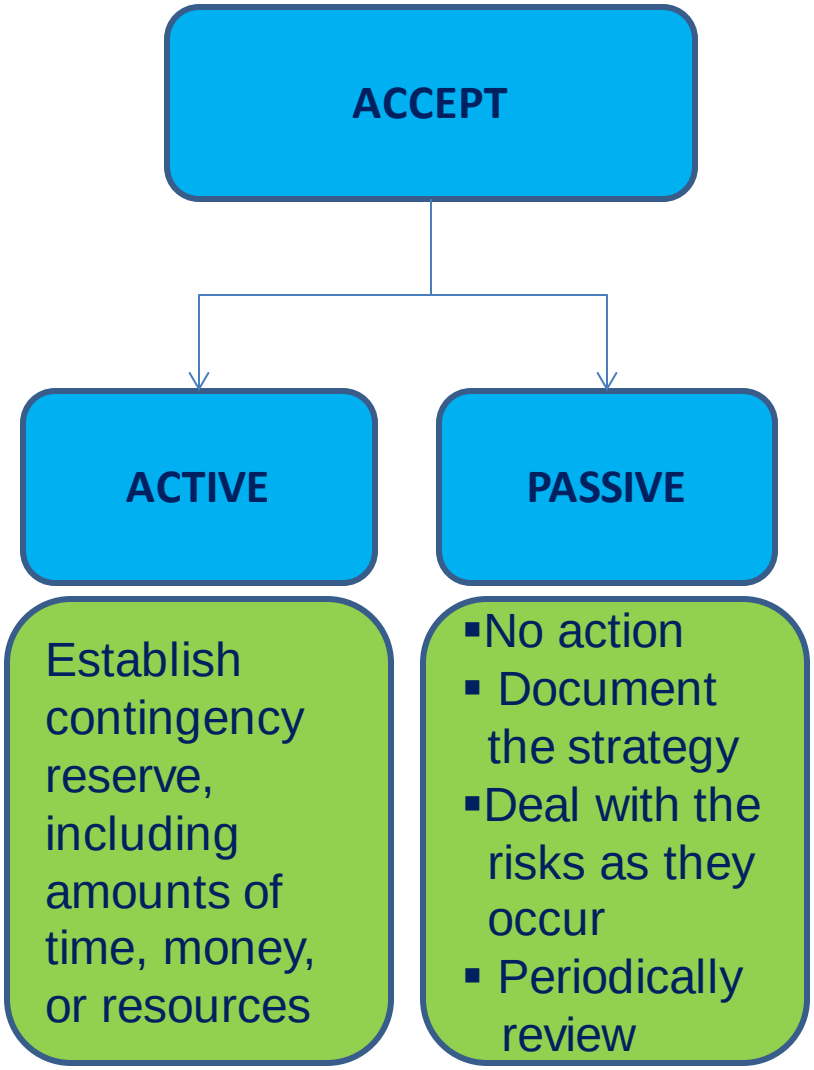
- This strategy :
  - Passive
  - Active.

- Passive acceptance

  Requires no action except to document the strategy, leaving the project team to deal with the risks as they occur, and to periodically review the threat to ensure that it does not change significantly.

- Active acceptance

  The most common active acceptance strategy is to establish a contingency reserve, including amounts of time, money, or resources to handle the risks.



LESSON 8. Plan Risk Responses
8.3.2 Tools and Techniques

2-Strategies for Positive Risks or Opportunities

- Four responses are dealing with opportunities.
  1. Exploit.
  2. Share.
  3. Enhance.
  4. Accept

- The fourth strategy, accept, can be used for threats or opportunities.

LESSON 8. Plan Risk Responses
8.3.2 Tools and Techniques

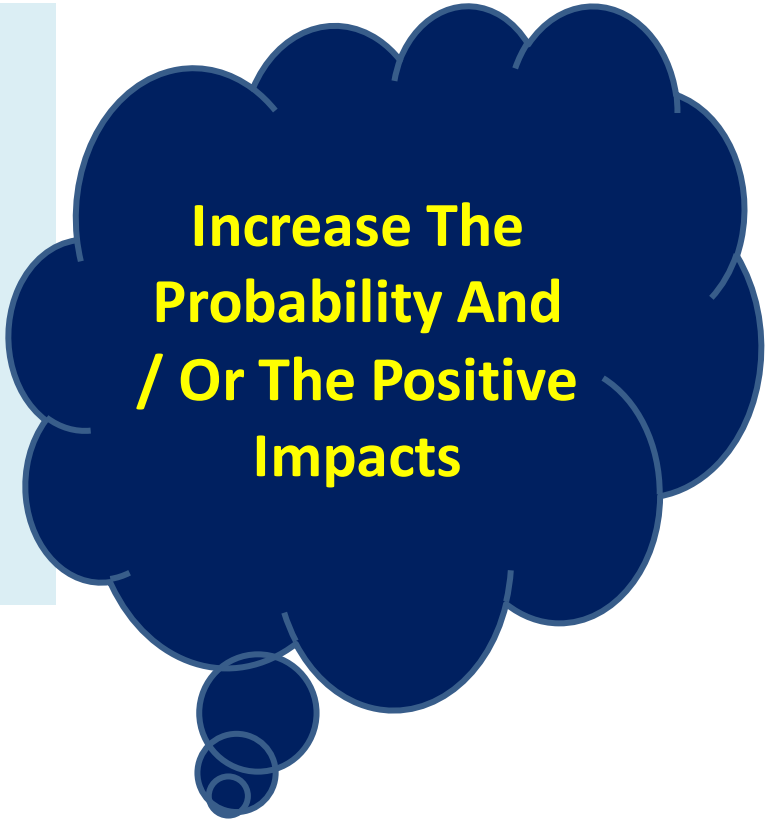
2.1- Exploit

- The exploit strategy may be selected for risks with positive impacts where the organization wishes to ensure that the opportunity is realized.
- This strategy seeks to eliminate the uncertainty associated with a particular upside risk by ensuring the opportunity definitely happens.
- Examples of directly exploiting responses include:
  - Assigning an organization's most talented resources to the project to reduce the time to completion.
  - Using new technologies or technology upgrades to reduce cost and duration required to realize project objectives.

LESSON 8. Plan Risk Responses
8.3.2 Tools and Techniques

2.2- Enhance

- The enhance strategy is used to increase the probability **and/or** the positive impacts of an opportunity.
- Identifying and maximizing key drivers of the impact may increase the probability.
- Examples of enhancing :
  Adding more resources to an activity to finish early.



LESSON 8. Plan Risk Responses
8.3.2 Tools and Techniques

2.2- Share

- Sharing a positive risk:
  Involves allocating some or all of the ownership of the opportunity to a third party who is best able to capture the opportunity for the benefit of the project.

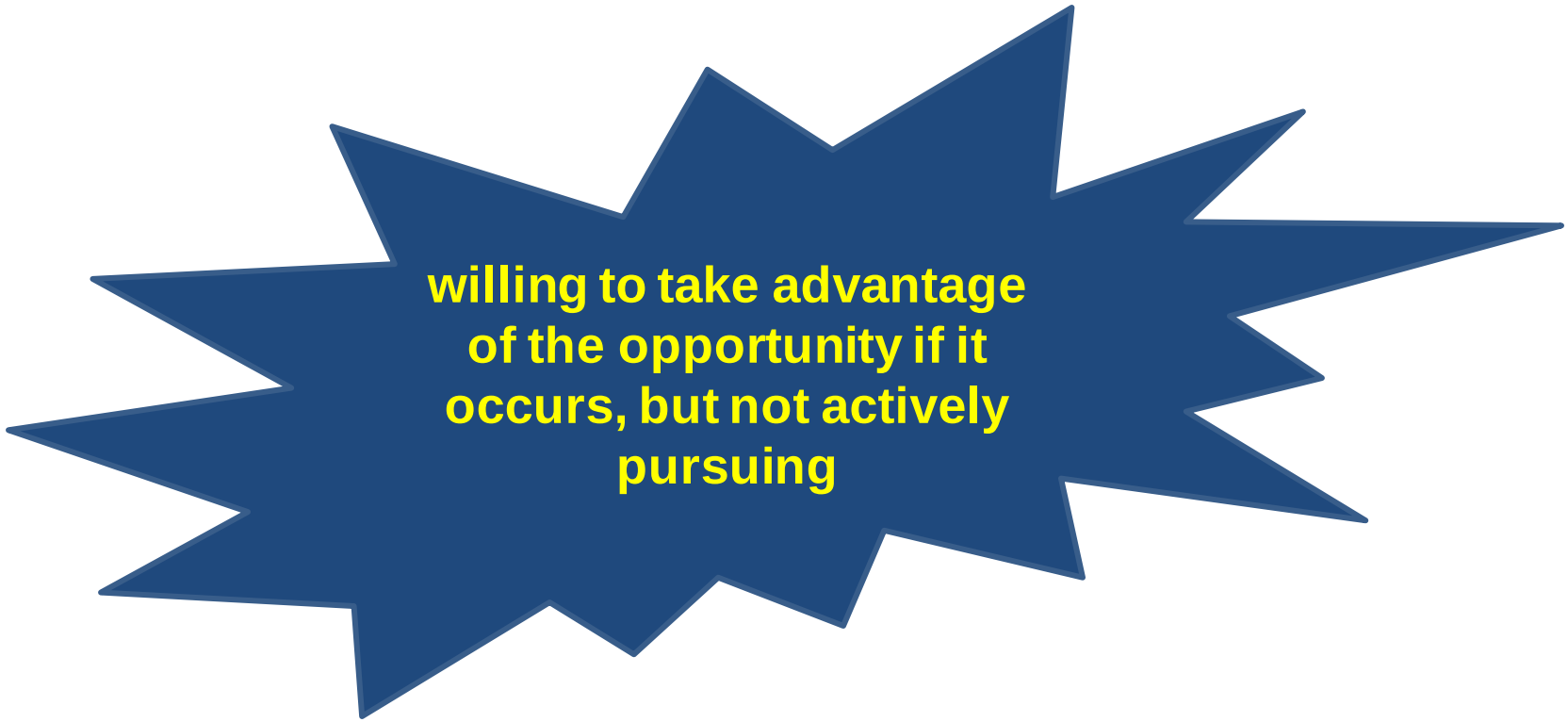
- **Examples of sharing**
  - Forming risk-sharing partnerships.
  - Teams.
  - Special-purpose companies.
  - Joint ventures.

- Established to express purpose of taking advantage of the opportunity so that all parties gain from their actions.

LESSON 8. Plan Risk Responses
8.3.2 Tools and Techniques

2.4- Accept

Accepting an opportunity is being willing to take advantage of the opportunity if it occurs, but not actively pursuing it.



Question

You work as a project manager for Organization. You are preparing to plan risk responses for your project with your project team. What are the risk responses for a positive risk event in the project?

A. Exploit, Enhance, Accept and Transfer.
B. Exploit, Enhance, Accept and Share.
C. Exploit, Mitigate, Enhance and Accept.
D. Exploit, Enhance, Share and Avoid

Correct answer is B.
Risk responses plans for positive risks are exploiting, enhance, share, and accept according to Pmbok 5 page 344 and 345

Question

You work as a project manager for MEGA Inc. You are preparing to plan risk responses for your project with your project team. What are the risk responses for a negative risk event in the project?

A. Avoid, Mitigate, Transfer and Accept.
B. Avoid, Mitigate, Share and Accept.
C. Avoid, Mitigate, Enhance and Accept.
D. Avoid, Mitigate, Accept and Exploit.

Answer is A.
Risk responses plans for negative risks are Avoid, Mitigate, Transfer and Accept according to Pmbok 5 page 343 and 344.

Question

You work as a project manager for HAJ Inc. You are preparing to plan risk responses for your project with your project team. What is the common Risk response for Positive and negative Risks?

A. Exploit.
B. Mitigate.
C. Accept.
D. Enhance.

Correct answer is C.
The common risk response plan for negative and positive risks is accept response plan according to Pmbok 5 page 344 and 346.

LESSON 8. Plan Risk Responses
8.3.2 Tools and Techniques

3- Expert Judgment

Expertise may be provided by any group or person with specialized:

- Education.
- Knowledge.
- Skill.
- Experience.
- Training.

in establishing risk responses.

LESSON 8. Plan Risk Responses
8.3.2 Tools and Techniques

4- Applying Risk Response Strategies to Overall Project Risk

The four risk response strategies can be applied to address overall project risk as follows:

- Avoid "Cancel the project, as a last resort, if the overall level of risk remains unacceptable".
- Share "Set up a business structure in which the customer and the supplier share" the risk.
- Avoid "Re-plan the project or change the scope and boundaries of the project, for example, by modifying the project priority, resource allocations, delivery calendar, etc.
- Mitigate " Address risks with exposure that exceeds the desired level.

LESSON 8. Plan Risk Responses
8.3.2 Tools and Techniques

5- Contingent Response Strategies

- Some responses are designed for use only if certain events occur(Trigger Condition).
- For some risks the project team develop a response plan that will only be executed under certain predefined conditions, if it is believed that there will be sufficient warning to implement the plan.
- Events that trigger the contingency response should be defined and tracked, such as:
  - Missing intermediate milestones
  - Gaining higher priority with a supplier.
- This type of responses called contingency plans and include identified triggering events that set the plans in effect.

LESSON 8. Plan Risk Responses
8.3.2 Tools and Techniques

5- Contingent Response Strategies contd.

Trigger Condition. An event, circumstance or situation that indicates that a risk is about to occur and under which a risk strategy or risk action will be invoked.

- For specific (normally high-impact) risks, the risk owner may choose to assemble a team to develop a response, as if the risk had genuinely happened.
- The corresponding plan, with the supporting information, should then be documented and approved at project management or sponsor level.
- This approval must include authorization to deploy the corresponding resources if the predefined **trigger conditions arise.**

LESSON 8. Plan Risk Responses
8.3.2 Tools and Techniques

5- Contingent Response Strategies contd.

Technique	Strengths	Weaknesses	CSFs
Contingency planning	• Ensures that actions are available to address significant events before their occurrence • Allows rapid and focussed response • Improves image of professionalism of the way in which the project is managed	• Can give a false feeling of confidence – as if the risk had been avoided	• The trigger conditions must be clearly defined and tracked • The plans need to be validated periodically • Willingness of the organization to execute the plan and provide the budget and resources when the trigger condition occurs

LESSON 8. Plan Risk Responses
8.3.2 Tools and Techniques

6- Contingency Reserve Estimation.

- **An amount (time and cost) needs to be allocated to fund the following:-**
  - Conditional response plans(Contingent responses).
  - Residual risks
  - Secondary risk
  - Any identified risk if occurs.
  - Fallback plan.
  - Passively acceptance if occurs.
  - Passively acceptance if changed significantly and need response.
- Quantitative methods can be used to determine the amounts that should be set aside.
  - Decision trees for conditional responses.
  - Simulation for the set of unspecified risks(Passive acceptance).
  - For other risks by decision tree or the simulation.

LESSON 8. Plan Risk Responses
8.3.2 Tools and Techniques

6- Contingency Reserve Estimation contd.

Contingency Reserve.
Time, cost, recourse that is allocated for identified risks that are accepted and for which contingent or mitigating responses are developed.

The contingency reserve may be a percentage of the estimated cost, a fixed number, or may be developed by using quantitative analysis methods.

These reserves are tracked and managed in Monitor and Control Risks.

Technique	Strengths	Weaknesses	CSFs
Contingency reserve estimation	• Provides a rationale for reserves • Basis for constructive discussion with sponsor	• Makes the reserve visible and therefore liable to be reduced arbitrarily	• Policy for reserve management agreed with sponsor and senior management

LESSON 8. Plan Risk Responses
8.3.2 Tools and Techniques

7- Multi-Criteria Selection Techniques

❑This is an adaptation of the Perform Qualitative Risk Analysis Process based on selection criteria.

❑The spreadsheet used to calculate the **weighted scores** of two options, based on a predefined set of **prioritized criteria**: points = weight x rating

Criterion	Weight	Option A		Option B	
		Rating	Points	Rating	Points
Price	9	8	72	10	90
Functionality	9	5	45	8	72
Ease of use	6	9	54	7	42
Lead time	7	9	63	6	42
Scores			234		246

Technique	Strengths	Weaknesses	CSFs
Multi-criterion selection techniques	• Provide a means of selecting the responses that best supports the full set of project objectives	• Can give counter-intuitive results	• Needs an agreed set of weighted project success criteria

LESSON 8. Plan Risk Responses
8.3.2 Tools and Techniques

8- Scenario Analysis

- Scenario analysis for risk response planning involves defining several reasonable alternative scenarios.
- The different scenarios may require different risk responses that can be described and evaluated for their cost and effectiveness.
- If the organization can choose between scenarios, the alternatives including the responses can be compared.
- If the scenarios are out of the control of the organization, the scenario analysis can lead to effective and necessary contingency planning.

Technique	Strengths	Weaknesses	CSFs
Scenario Analysis	• Provides view of the potential effect of the relevant risk and the corresponding response strategy • Forces the participants to analyze the effect of any strategy • Helps to identify secondary risks	• Adds to the list of assumptions • Can be time consuming	• All participants need a good understanding of the project plans

Question

In your project site the generator always outages, therefore you bought backup generator, during the execution of the project the main generator tripped (switched off due to fault), the responsible technician for generators approached you to inform that the backup generator may fail to switch on. What is the new risk?

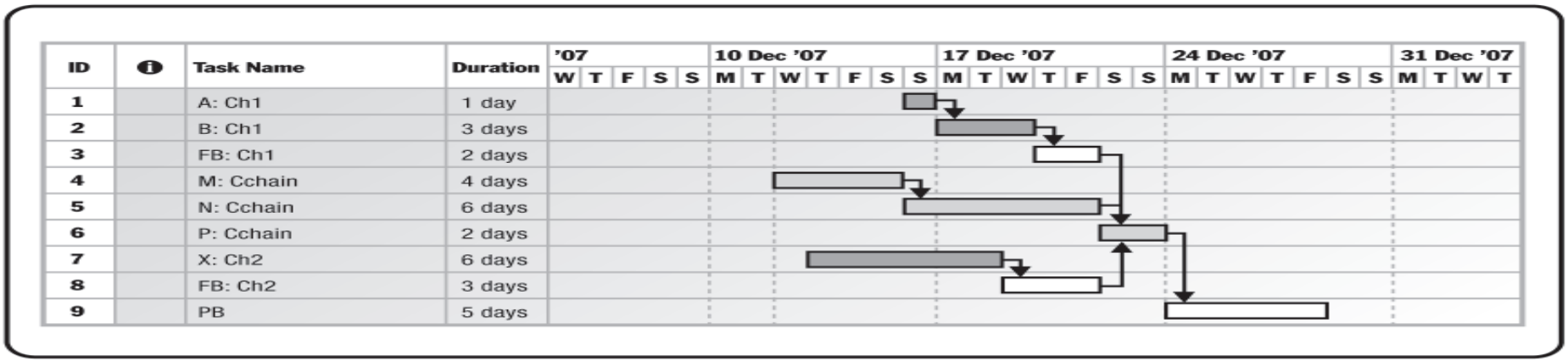
A. Residual risk.
B. Secondary risk.
C. Business risk.
D. Primary risk.

Correct answer is B.
Secondary risks that arise as a direct outcome of implementing a risk response, due to the implementation of the mitigation risk response, new risk arise which the backup generator may fail to switch on. The reference is BMBOK 5 page #348

LESSON 8. Plan Risk Responses
8.3.2 Tools and Techniques

9- Critical Chain Project Management (CCPM)

- The critical chain is the resource-constrained critical path.
- The critical chain method adds duration buffers that are non-work schedule activities to manage uncertainty.
- Project buffer is placed at the end of the critical chain, protects the target finish date from slippage along the critical chain.
- Feeding buffers, are placed at each point where a chain of dependent activities that are not on the critical chain feeds into the critical chain. protect the critical chain from slippage along the feeding chains.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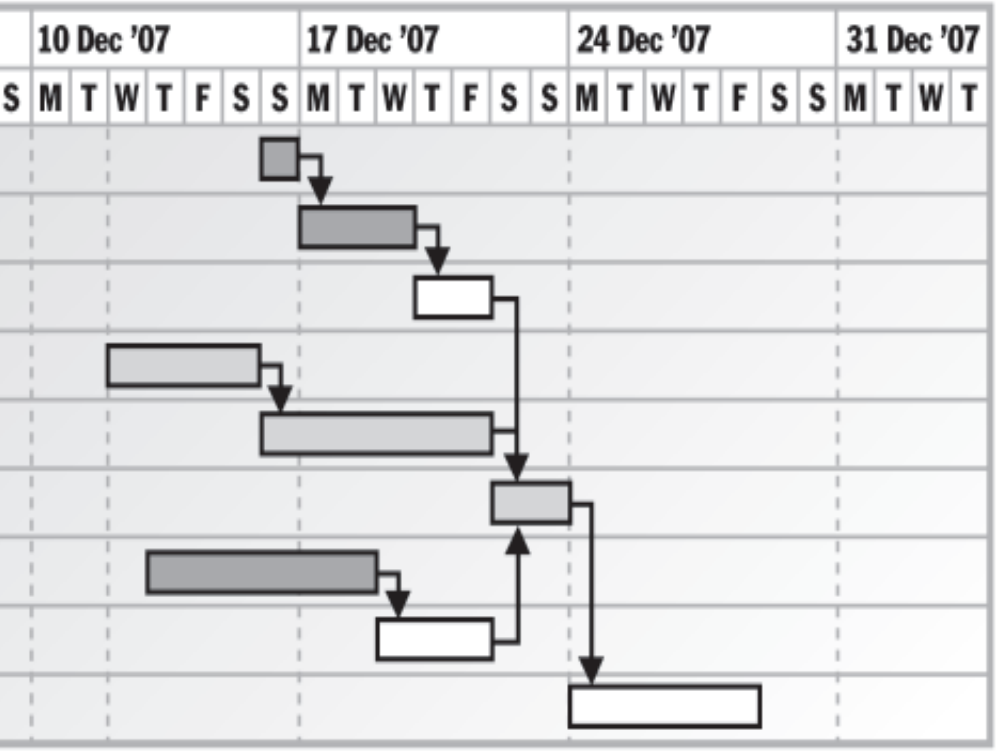
Task Name
Duration
'07
10 Dec '07
17 Dec '07
24 Dec '07
31 Dec '07
W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T
1 A: Ch1 1 day
2 B: Ch1 3 days
3 FB: Ch1 2 days
4 M: Cchain 4 days
5 N: Cchain 6 days
6 P: Cchain 2 days
7 X: Ch2 6 days
8 FB: Ch2 3 days
9 PB 5 days

LESSON 8. Plan Risk Responses
8.3.2 Tools and Techniques

9- Critical Chain Project Management

ID	Task Name	Duration
1	A: Ch1	1 day
2	B: Ch1	3 days
3	FB: Ch1	2 days
4	M: Cchain	4 days
5	N: Cchain	6 days
6	P: Cchain	2 days
7	X: Ch2	6 days
8	FB: Ch2	3 days
9	PB	5 days



LESSON 8. Plan Risk Responses
8.3.2 Tools and Techniques

9- Critical Chain Project Management

Technique	Strengths	Weaknesses	CSFs
Critical Chain Project Management (CCPM)	• Along with many other approaches, insists on resolving resource availability issues when developing the schedule • Addresses schedule risk by the addition of "feeding buffers" to absorb statistical variations on the durations of non-critical path activities to reduce their contribution to schedule risk • Partly mitigates financial risk by controlling the amount of "work in process"	• Feeding buffers can deal with predictable common cause variation, but may be inadequate to cater for special causes • "Indicative" start and end dates can disturb conventional management expectations, and may cause problems for setting intermediate milestones • Assumption that base estimates represent 50% confidence levels (this weakness	• Requires a fully resourced project schedule • Understanding of, and acceptance by management and project team members that the activity dates are indicative rather than definitive promises, being generally set to provide a 50% confidence level • Equitable sharing of the buffers by all team members concerned

LESSON 8. Plan Risk Responses
8.3.2 Tools and Techniques

9- Critical Chain Project Management

Technique	Strengths	Weaknesses	CSFs
	• "Buffer penetration" thresholds can be used as trigger condition for specific response actions • Special software is available for creating and managing the buffers	is not followed in all variants of this class of tool) • Not all project schedules are fully resourced	

LESSON 8. Plan Risk Responses
8.3.2 Tools and Techniques

10- Brainstorming

11- Check Lists

12- Decision Tree Analysis

Technique	Strengths	Weaknesses	CSFs
Decision Tree Analysis	• Allows calculation of the expected monetary values of various response options as well as the value of the outcomes in the worst case and the best case		

LESSON 8. Plan Risk Responses
8.3.2 Tools and Techniques

13- Delphi Technique

14- Expected Monetary Value **(EMV)**

15- Force Field Analysis

16- Industry knowledge base

Technique	Strengths	Weaknesses	CSFs
Delphi Technique	• Involves selected experts in the process		
Expected Monetary Value (EMV)	• Provides an estimate of the potential benefit of a risk response		
Force Field Analysis	• The diagram can suggest where best to apply the responses		
Industry knowledge base	• Some risks have standard responses		

LESSON 8. Plan Risk Responses
8.3.2 Tools and Techniques

17- Interviews

18- Nominal Group Technique

19- Post-project reviews/ Lessons Learned/ Historical Information

Technique	Strengths	Weaknesses	CSFs
Interviews	• Experienced practitioners can provide both new ideas and act as "devil's advocate" for potential responses		
Nominal Group Technique	• Useful as a creativity technique for generating novel responses		
Post-project reviews/ Lessons Learned/ Historical Information	• Leverages previous experience		

LESSON 8. Plan Risk Responses
8.3.2 Tools and Techniques

20- Prompt Lists | **21- Quantitative Risk Analysis** | **22- Root-Cause Analysis**

Technique	Strengths	Weaknesses	CSFs
Prompt Lists → *see Chapter 5*	• Stimulates creativity		
Quantitative Risk Analysis → *see Chapter 7*	• Provides a means of evaluating the potential effect of the response plans on the overall project risk	• Can be too involved or complex for the benefit envisaged	• Prior effective qualitative analysis
Root-Cause Analysis → *see Chapter 5*	• Allows the organization to identify and to address the fundamental causes of risks for efficient and effective responses; responding at the level of the root cause may effectively address multiple risks • Can provide a means of identifying symptoms for use as trigger conditions for contingent responses		

Question

Kelly is working as a project manager for her organization Petrol-JQ. She and her team are working on the plan risk responses process, while they are developing the responses, the risk manager informs them that they have to know the estimates of the potential benefits of the responses. Which of the following can help?

A. Tornado Diagram.
B. Contingency reserve.
C. EMV.
D. Contingency planning.

Correct answer is C.
"EMV provides an estimate of the potential benefit of a risk response" is strength of EMV. Reference: Practice Standard for Project Risk Management page#98.

Question

You are working as a project manager of a new resort project for your organization. You and your team are working on the plan risk responses process. During the meeting, the risk manager informs that there are some risks have standard responses to save the time. Which one of the following can help?

A. Industry knowledge base.
B. System Dynamics.
C. Contingency planning.
D. Forced Field diagram.

Correct answer is A.
"Some risks have standard responses" is strength of Industry knowledge base. Reference: Practice Standard for Project Risk Management page#98.

Question

You are the risk manager of a new project for your organization MARCE Inc. While you are working on the plan risk responses process, using a technique that can provide a means of identifying symptoms for use as trigger conditions for contingent responses. What are we talking about?

A. Quantitative Risk Analysis
B. FMEA/Fault Tree Analysis.
C. System Dynamics.
D. Root-Cause Analysis.

Correct answer is D.
"Allows the organization to identify and to address the fundamental causes of risks for efficient and effective responses; responding at the level of the root cause may effectively address multiple risks. Can provide a means of identifying symptoms for use as trigger conditions for contingent responses are strengths of Root-Cause Analysis. Reference: Practice Standard for Project Risk Management page#99.

LESSON 8. Plan Risk Responses
8.3.2 Tools and Techniques

Tools and techniques categories

There are four categories of tools and techniques:

1. Creativity tools to identify potential responses.
2. Decision-support tools for determining the optimal potential response.
3. Strategy implementation techniques designed to turn a strategy into action.
4. Tools to transfer control to the Monitor and Control Risks process.

LESSON 8. Plan Risk Responses
8.3.2 Tools and Techniques

Planning risk responses steps

1- Response Identification

- Risk response planning use the available information about the potential risks to determine the optimal set of responses.
- Involve subject matter experts and employ creativity techniques in order to explore all of the options.
- Project planning and execution techniques are then required to evaluate the potential effects of the various options on the project's objectives.

LESSON 8. Plan Risk Responses
8.3.2 Tools and Techniques

Planning risk responses steps

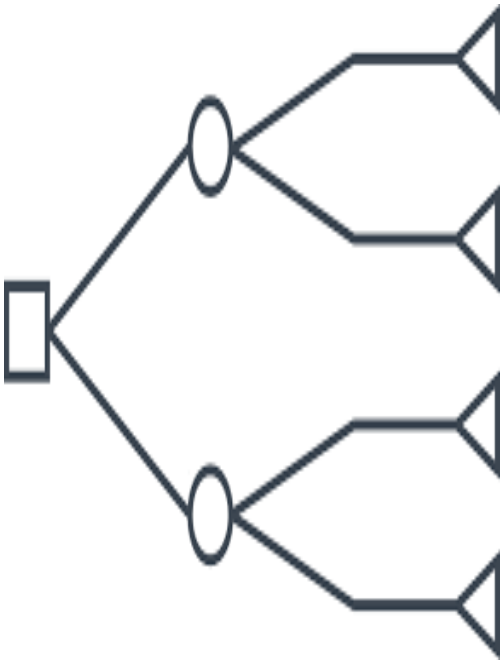
2- Response Selection

1. Once the set of potential responses is established, decision-support techniques may need to select the best possible subset from these responses.

2. The selection process should take into account:
   - Cost of the responses.
   - Impact on the project objectives.
   - Uncertainty of outcomes.
   - Possible secondary and residual risks.

3. Identify Risks, Quantitative Analysis, Plan Risk Responses may then need to be applied to the resultant project management plan and the residual and secondary risks that it would entail.

4. This iterative approach continues until all of the individual risks are deemed acceptable and the **overall risk is within a predefined threshold.**



LESSON 8. Plan Risk Responses
8.3.2 Tools and Techniques

Planning risk responses steps

3- Action Planning

- Project planning tools are used to turn the chosen strategies into concrete actions and to integrate these into existing plans.

- The corresponding actions may be:
  - Unconditional (i.e., integrated into the project management plan).
  - Contingent on a trigger condition and predefined as a contingency response strategy.

Strategies → **Actions** → **Integrate Into Plans**

LESSON 8. Plan Risk Responses
8.3.2 Tools and Techniques

Planning risk responses steps

4- Ownership and Responsibility Assignment

- The project manager needs to use resource assignment processes to ensure the availability of an owner for each risk and for each response action.
- Each associated risk is managed and each corresponding risk response is carried out in a timely and effective manner.
- Every contingency response strategy should include a set of trigger conditions.
- Risk action owner responsible for monitoring these conditions , and should be clearly assigned in the Plan Risk Responses and managed in the Monitor and Control Risks.

LESSON 8. Plan Risk Responses
8.3.2 Tools and Techniques

4- Ownership and Responsibility Assignment

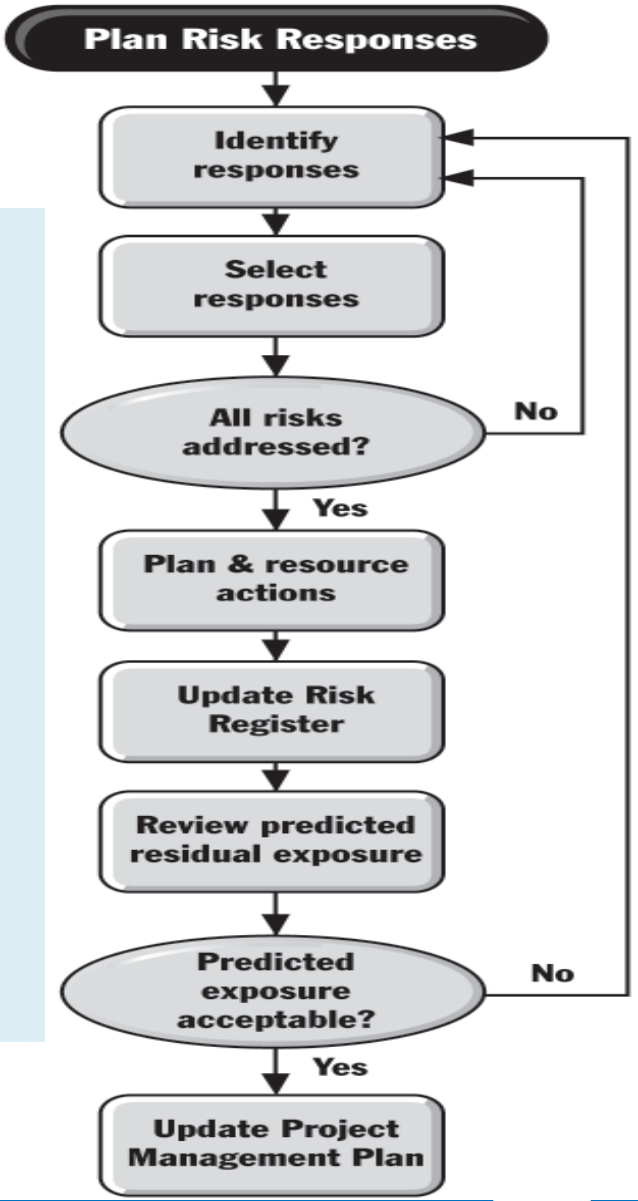
The strategic definition of risk responses should include measurable criteria for success of the response.

Risk action owners:

- Monitor their assigned risk response.
- Take agreed-upon actions as required.
- Provide the risk owners with relevant information on status or changes to the risk characteristics.

Risk owners:

- Assess the effectiveness of any actions.
- Decide whether additional actions are required.
- Keep the project manager informed of the situation.



Question

During the execution of your project, one risk emerged as a direct result of implementing a risk response plan, how can you deal with the new risk?

A. Workaround.
B. Fallback plan.
C. Analyzed and planned for in the same way as those risks which were initially identified.
D. Identify, Analyze, Document and communicate to the relevant stakeholders.

Correct answer is C.
The secondary risks have to be analyzed and planned for in the same way as those risks which were initially identified. The reference is risk practice standard page #43

Question

You are a project manager in your Organization; the risk manager approached you to discuss how to protect the project against the thief. Which of the following protect the project from the thief?

A. Cancel the project.
B. Buy Insurance.
C. Mitigate.
D. Accept.

Correct answer is B.
The best response against thief is transference strategy (transfer the risk responsibility to third party by insurance or contract…). The reference is PMBOK page# 344.

LESSON 8. Plan Risk Responses
8.3.3 OUTPUT

1- Project Management Plan Updates

Schedule management plan.

Updated to reflect changes in process and practice driven by the risk responses. Include

- Changes in tolerance or behavior related to resource loading and leveling.
- Updates to the schedule strategy.

Cost management plan.

Updated to reflect changes in process and practice driven by the risk responses, include:

- Changes in tolerance or behavior related to cost accounting, tracking, and reports.
- Updates to the budget strategy and how contingency reserves are consumed.

Quality management plan.

Updated to reflect changes in process and practice driven by the risk responses. Include

- Changes in tolerance or behavior related to requirements, quality assurance, or quality control.
- Updates to the requirements documentation.

Procurement management plan.

Updated to reflect changes in strategy, such as:

- Alterations in the make-or-buy decision.
- Contract type(s) driven by the risk responses.

LESSON 8. Plan Risk Responses
8.3.3 OUTPUT

1- Project Management Plan Updates

Human resource management plan.
The staffing management plan, part of the human resource management plan, is updated to reflect changes in project organizational structure and resource applications driven by the risk responses. This may include changes in tolerance or behavior related to staff allocation, as well as updates to the resource loading.

Scope baseline.
Because of new, modified or omitted work generated by the risk responses, the scope baseline may be updated to reflect those changes.

Schedule baseline.
Because of new work (or omitted work) generated by the risk responses, the schedule baseline may be updated to reflect those changes.

Cost baseline.
Because of new work (or omitted work) generated by the risk responses, the cost baseline may be updated to reflect those changes.

LESSON 8. Plan Risk Responses
8.3.3 OUTPUT

2- Project Documents Updates

- When appropriate risk responses are chosen and agreed upon, they are included in the risk register.
- The risk register should be written to a level of detail that corresponds with the priority ranking and the planned response.
- Often, the high and moderate risks are addressed in detail.
- Low priority are included in a watch list for periodic monitoring.

LESSON 8. Plan Risk Responses
8.3.3 OUTPUT

2- Project Documents Updates

2-1 Risk register updates

1. **Risk action owners** and assigned responsibilities.
2. **Update Risk owners** and assigned responsibilities.
3. **Agreed-upon** response strategies.
4. **Specific actions** to implement the chosen response strategy.
5. **Trigger conditions**, symptoms, and warning signs of a risk occurrence.
6. **Budget and schedule** activities required to implement the chosen responses;
7. **Contingency plans** and triggers that call for their execution;
8. **Fallback plans** for use as a reaction to a risk that has occurred and the primary response proves to be inadequate.
9. **Residual risks** that are expected to remain after planned responses have been taken.
10. **Secondary risks** that arise as a direct outcome of implementing a risk response.
11. **Contingency reserves** that are calculated based on the quantitative risk analysis of the project and the organization's risk thresholds.

LESSON 8. Plan Risk Responses
8.3.3 OUTPUT

2- Project Documents Updates

2-1 Risk register updates cond.

RISK REGISTER

Risk Identification						Qulitative process								Quantitative Process					Plan Risk Responses									
Risk description	Causes	Effects	ROOT Cause	Potential Risk Response	Nominated Risk Owner	Probability	Impact	Ranking or scores	urgency	Category	Risk in watch list	Trend in qualitative risk results	Need further analysis	Need Response	Probabilistic analysis	Probability of completion date	Probability of total cost	Prioritized list of quantified risks	Trends in quantitative	Risk owners and response responsibilities	Agreed-upon response strategies	Risk Action owners and responsibi	Actions of Response stratigy	Trigger conditions&symptoms	Budget and schedule activities	Contingency plans and triggers	Fallback plans	Residual risks	Secondary risks	Contingency reserves

LESSON 8. Plan Risk Responses
8.3.3 OUTPUT

2- Project Documents Updates cond.

2-2 Assumptions log updates.

As new information becomes available through plan risk responses, assumptions could change. The assumptions log needs to be revisited.

2-3 Technical documentation updates.

As new information becomes available through Plan risk responses, technical approaches and physical deliverables may change. Any supporting documentation needs to be revisited.

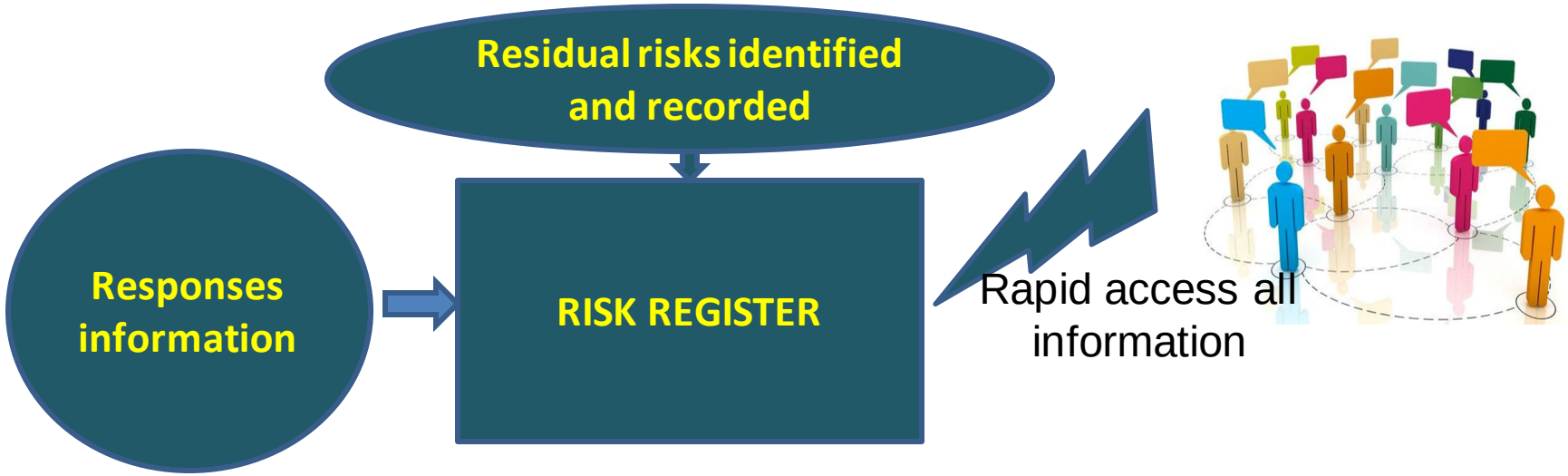
2-4 Change requests.

Planning for risk responses can result in recommendations for changes to the resources, activities, cost estimates, and others. Then change requests are generated and processed through the Perform Integrated Change Control process.

LESSON 8. Plan Risk Responses
8.4 Documenting the Results

1- Add Risk Responses to the Risk Register

- The response-related information for each risk is recorded in the risk register and updated regularly.
- Any interested stakeholder should be able to rapidly access all the information required to verify their responsibilities and manage the risk in accordance with the risk response plan.
- The set of residual risks and their priorities are clearly identified and recorded.



LESSON 8. Plan Risk Responses
8.4 Documenting the Results

2- Add Corresponding Risk Responses to the Project Management Plan

❑ While developing the detailed set of risk responses, the project-related implications are evaluated for inclusion in a modified project management plan.

❑ These include:

- Costs.
- Resource assignments.
- Scheduling details.
- Changes to project documentation.

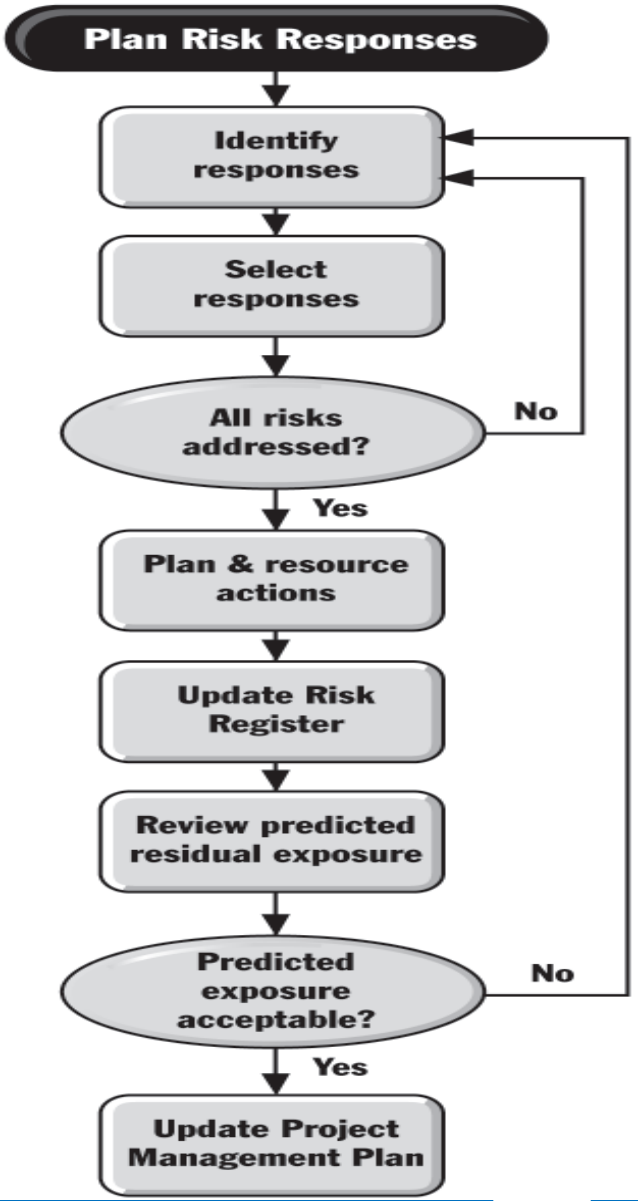
❑Until these changes are formally approved along with the additional risks that they may carry, risk response planning cannot be considered complete.

Developing The Detailed Responses ⇒ **Evaluate The Implication Of The Project** ⇒ **Modify The Project Plan** ⇒ **Response Be Completed After The Formal Approval Of Changes**

LESSON 8. Plan Risk Responses
8.4 Documenting the Results

3- Review and Document Predicted Exposure

- Once the risk responses have been defined and integrated into the project management plan.
  The individual and overall residual risks related to this plan are evaluated in order to determine whether additional response planning is required.
- This evaluation should provide an estimate of both:
  - The expected post-response situation.
  - The potential improvement of the risk exposure assuming that the proposed responses are effective.
- The evaluation should be documented.



Question

You are a project manager in your organization, you identified all knowable risks may impact the project, assessed, prioritized and responses plans are assigned to the risks. While you are in execution stage of the project, one unidentified risk occurs. How will you deal with this risk?

A. Workaround.
B. Fallback plan.
C. Contingency reserve.
D. Expert judgment.

Correct answer is A
The Unidentified risks handled by workaround if occurs. Workarounds are responses that were not initially planned but are required to deal with emerging risks that were previously unidentified or accepted passively. The reference is PMBOK5 Page #353

Question

You are a project manager in your organization, you identified all knowable risks may impact the project, assessed, prioritized and responses plans are assigned to the risks. While you are in execution stage of the project one of the identified risk occurs. How will you fund this risk?

A. Workaround.
B. Management reserve.
C. Contingency reserve.
D. Expert judgment.

Correct answer is C.
The identified risks use contingency reserve if occur and handled by fallback plan. Contingency Reserve is within the cost baseline or performance measurement baseline that is allocated for identified risks that are accepted and for which contingent or mitigating responses are developed. The reference is PMBOK5 Page #533.

RMP COACH

PROJECT RISK MANAGEMENT Course

PMI-RMP

LESSON 9
Control Risks

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Senior Project Manager
PgMP, PMP, PMI-RMP, OCP, 6SIGMA

PROJECT RISK MANAGEMENT PMI-RMP

Exam Content Outline

Domain 4: Risk Monitoring and Reporting

Activities related to monitoring risk, evaluating risk response against established metrics, and communicating risk response performance to stakeholders and project team.

Tasks	Risk Monitoring and Reporting (19–20%)
Task 1	Document and periodically update project risk information using standard tools (including but not limited to risk register, risk database) and techniques in order to maintain a single, current repository of all project risk information.
Task 2	Coordinate with project manager using communication techniques in order to integrate risk management throughout the project.
Task 3	Create periodic standard and custom reports using risk-related metrics as specified in the risk management plan in order to communicate risk management activities and status.

Domain 4: Risk Monitoring and Reporting

Tasks	Risk Monitoring and Reporting (19–20%)
Task 4	Monitor risk response metrics by analyzing risk response performance information, and present to key stakeholders in order to ensure resolution of risk and develop additional risk response strategies to address residual and secondary risks.
Task 5	Analyze risk process performance against established metrics in order to drive risk process improvements.
Task 6	Update the project risk management plan using relevant internal and external inputs in order to keep the plan current.
Task 7	Capture risk lessons learned through comprehensive review of the project risk management plan, risk register, risk audits, risk process performance reports, and other associated reports in order to incorporate into future risk planning.

LESSON5. IDENTIFY RISKS PROCESS

Question

Question

You are a project manager of DSD project with management reserve 10% of the baseline, You and your team in the control risk process ,some risks occurred and the management reserve become zero and the contingency reserve become 70% of its value. Reference to the below table What is the total estimated cost of the project activities and the previous probability of R2 before occurred?

A- 1,888,666.66 and 25%
B- 1,777,787.33 and 41%
C- 2,000,600.55 and 34%
D- 1,783,333.33 and 35%

Risk	Probability	Impact	Situation
R1	70%	20,000	Identified risk
R2	100%	35,000	Risk has a response plan
R3	50%	30,000	Identified risk
R4	30%	40,000	Identified risk
R5	70%	10,000	Identified risk
R6	100%	90,000	Unknown risk
R7	100%	100,000	Unidentified risk
R8	80%	70,000	Identified risk

LESSON5. IDENTIFY RISKS PROCESS

Question

Correct answer is D:

Baseline is B. Contingency reserve is CR. Management reserve is MR.

Estimated Cost is EC.

MR = I (R6) + I (R7) = 90,000+100,000= 190,000.

Project Budget = EC +CR +MR.

Given MR = 0.1 B

So B= 190,000/0.1= 1,900,000.

Baseline budget =B= 1,900,000.

Due to the occurrence of R2 the CR become 70%

0.3*CR = total impact of the identified risk R2 =35,000.

CR = 35,000/0.3=116,666.66.

B= EC + CR

EC= B-CR= 1,900,000 – 116,666.66 = 1,783,333.33.

** EC = 1,783,333.33 **

CR = SUM (I×P) Of identified risks.

116,666.66 =

0.7×20,000+P(R2)×35,000+0.5×30,000+0.3×40,000+0.7×10,000+0.8×70,000

P (R2) = 35%

Risk	Probability	Impact	Situation
R1	70%	20,000	Identified risk
R2	100%	35,000	Risk has a response plan
R3	50%	30,000	Identified risk
R4	30%	40,000	Identified risk
R5	70%	10,000	Identified risk
R6	100%	90,000	Unknown risk
R7	100%	100,000	Unidentified risk
R8	80%	70,000	Identified risk

LESSON 9 Control Risks

9.1 Introduction

Control Risks

The process of implementing risk response plans, tracking identified risks, monitoring residual risks, identifying new risks, and evaluating risk process effectiveness throughout the project.

The key benefit

It improves efficiency of the risk approach throughout the project life cycle to continuously optimize risk responses.

Planned risk responses

Are executed during the life cycle of the project, but the project work should be continuously monitored for new, changing, and outdated risks.

LESSON 9 Control Risks

9.2 Purpose and Objectives

- Track identified risks.
- Monitor residual risks.
- Identify new risks.
- Ensure that risk response plans are executed at the appropriate time, and evaluate their effectiveness throughout the project life cycle.
- Tracking and managing the risk response actions.
- Review the effectiveness of all of the Project Risk Management processes to provide improvements to the management of the current project as well as future ones.
- Ensure that the trigger conditions are effectively monitored and that the corresponding actions are carried out as defined, in a timely manner. It is the responsibility of the action owner.

LESSON 9 Control Risks

9.2 Purpose and Objectives

- Control Risks can involve choosing alternative strategies.
- Executing a contingency or fallback plan.
- Taking corrective action, and modifying the project management plan.
- Updating the organizational process assets.
  - Including project lessons learned databases and risk management templates, for the benefit of future projects.
- Control Risks applies techniques, such as variance and trend analysis, which require the use of performance information generated during project execution.
- Other purposes of the Control Risks process are to determine if:
  - Project assumptions are still valid.
  - Analysis shows an assessed risk has changed or can be retired.
  - Risk management policies and procedures are being followed.
  - Contingency reserves for cost or schedule should be modified in alignment with the current risk assessment.

Question

You are the project manager in your organization. You just completed the plan risk response process. When will the risk response plans be implemented?

A. Plan risk response process.
B. Identify risk process.
C. Throughout the project life cycle.
D. Plan risk management.

Correct answer is C.
Planned risk responses that are included in the risk register are executed during the life cycle of the project. PMBOK 5 Page #350

LESSON 9 Control Risks

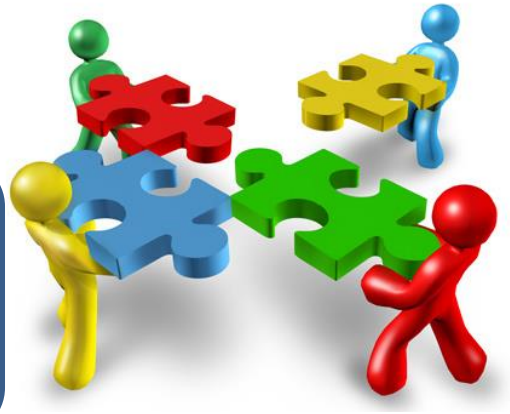
9.2 Purpose and Objectives

- The first action of control risk is to check whether all of the approved unconditional response actions have been included and defined in the current project management plan and take any appropriate action if necessary, such as:
  - invoking the **change management process** with respect to any missing actions. This will then ensure that the agreed-upon actions are carried out within the normal project execution framework.

Check That The Response Actions have been Included In the Project Plan

If No

Invoke change management process



To ensure that the agreed-upon actions are carried out within the normal project execution framework

LESSON 9 Control Risks

9.2 Purpose and Objectives

- The risk owners and risk action owners need to be briefed on any changes that may affect their responsibilities.
- Effective communication needs to be maintained between them and the project manager.
  - So they accept accountability for controlling the potential outcomes of specific risks.
  - Apply their best efforts to track the associated trigger conditions
  - Carry out the agreed-upon responses in a timely manner.

PM

Risk Owner

Risk action Owner

Effective communication

LESSON 9 Control Risks
9.2 Purpose and Objectives

- The mechanism for measuring the effectiveness of the response is provided by the Plan Risk Responses process.

- The **risk action owner** should keep the risk owner aware of the status of the response actions.
  - So that the **risk owner** can decide that additional actions need to be planned and implemented or not.

LESSON 9 Control Risks

9.2 Purpose and Objectives

- As the project progresses, additional information becomes available and the project environment may change as some risks occur, whether foreseen or unforeseen, and others become or cease(out dated or retired) to be relevant.

- The planning should be kept current, the project manager should ensure that periodic risk reassessment including **risk identification, analysis, and response planning:**

  - Repeated at reasonable intervals.
  - Repeated in response to project events, without generating excessive administrative overhead:

    - Occurrence of a major or unexpected risk.
    - Need to analyze a complex change request.
    - Phase end review.
    - Project re-planning or major plan elaboration.
    - Periodic review to ensure that the information remains current.

- If major organizational changes, risk management planning may need to be revisited before reassessing the risks.

LESSON 9 Control Risks

9.2 Purpose and Objectives

In addition to the regular status reviews, **Periodic Audits** should be performed to:

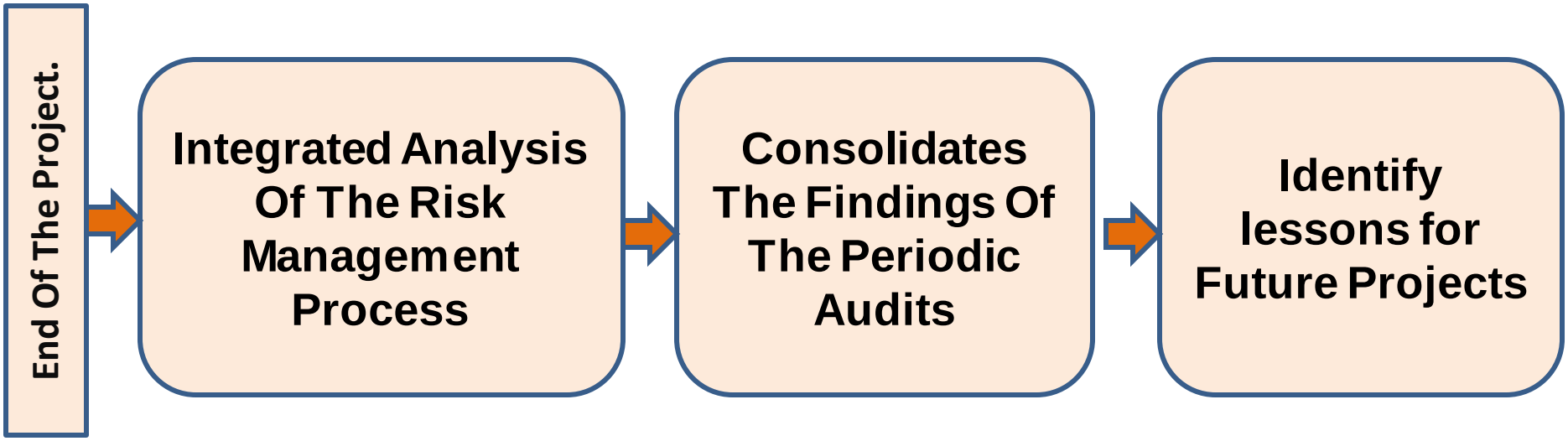
- Examine and document the effectiveness of risk responses in dealing with identified risks and their root causes, as well as the effectiveness of the risk management process.
- Determine strengths and weaknesses in handling risks within the project.
- Identifying any barriers to effectiveness or keys to success in risk management.
  - Recognition of which could lead to improvements in risk management of the current or future projects.

LESSON 9 Control Risks
9.2 Purpose and Objectives

At the end of the project.
an **integrated analysis** of the risk management process should be carried out with a focus on long-term process improvements.

This analysis **consolidates the findings** of the periodic audits to identify lessons that would be applicable in general to a large proportion of the organization's projects in the future, such as

- Appropriate levels of resources.
- Adequate time for the analysis.
- Use of tools.
- Level of detail, etc.


End Of The Project.
Integrated Analysis Of The Risk Management Process
Consolidates The Findings Of The Periodic Audits
Identify lessons for Future Projects

LESSON 9 Control Risks
9.2 Purpose and Objectives

At project closure:

- the project manager should ensure that a description has been given of the closure of every risk in the risk register.
  - (a) Did not occur.
  - (b) Occurred and contingency plan invoked.
  - (c) Occurred and impact to the project scope (i.e., time, cost, and quality).

- The output of the audit of the risk management process should be consolidated with specific information with respect to:
  - The project's experience of risks.
  - Any generally applicable guidelines for the organization should be highlighted and potential actions proposed for applying them.

- This can lead to an update to the corresponding OPA.

RISK REGISTER

Risk Identification						Qulitative process								Quantitative Process				Plan Risk Responses											Control Risk Process	
Risk describion	Causes	Effects	ROOT Cause	Potential Risk Response	Nominated Risk Owner	Probability	Impact	Ranking or scores	urgency	Category	Risk in watch list	Trend in qualitative risk results	Need further analysis	Need Response	Probabilistic analysis	Probability of completion date	Probability of total cost	Prioritized list of quantified risks	Trends in quantitative	Risk owners and responsibilities	Agreed-upon response strategies	Risk Action owners and responsibil	Actions of Response strategy	Trigger conditions&symptoms	Budget and schedule activities	Contingency plans and triggers	Fallback plans	Residual risks	Secondary risks	Contingency reserves	Outcomes of risk reassessments, risk audits, and periodic risk reviews:- - Identification of new risks. - Updates to probability, impact, priority, response plans and ownership. - Update other elements of the risk register. - Outcomes includes closing risks that are no longer applicable and releasing their associated reserves.	Actual outcomes of the project's risks and of the risk responses. This information can help project managers to plan for risk throughout their organizations, as well as on future projects.

LESSON 9 Control Risks
9.3 Critical Success Factors

1- Integrate Risk Monitoring and Control with Project Monitoring and Control

- **Early** in the planning, the actions required to **monitor and control** project risk should be included in the project management plan.
- Then adjusted in view of the risk response planning decisions, for example, the actions associated with monitoring specific conditions or metrics.
- Once risk response planning has been carried out, the project schedule should include all of the agreed-upon actions.
- So that they can be carried out as a normal part of project execution and tracked accordingly.

2- Continuously Monitor Risk Trigger Conditions

- Risk response actions to be carried out as part of the project schedule
- Actions whose execution is dependent on a predefined trigger condition.
  - Monitor the trigger condition is the responsibility of the risk action owner, in close collaboration with the risk owner under the overall authority of the project manager.

3- Maintain Risk Awareness

- Risk management reports should be a regular item on every status meeting agenda
  - Ensure that **all team members** remain **aware** of the importance of **risk management**
  - Ensure that it is **fully integrated** into all of the project management decisions.

- The project's senior-level sponsor should require :
  - Regular reports on the risks and planned responses.

to ensure that stakeholders are aware of the importance of keeping a focus on risk.

- **Sponsor feedback** also motivates the project team by demonstrating senior-level interest in Project Risk Management.

3- Maintain Risk Awareness (contd)

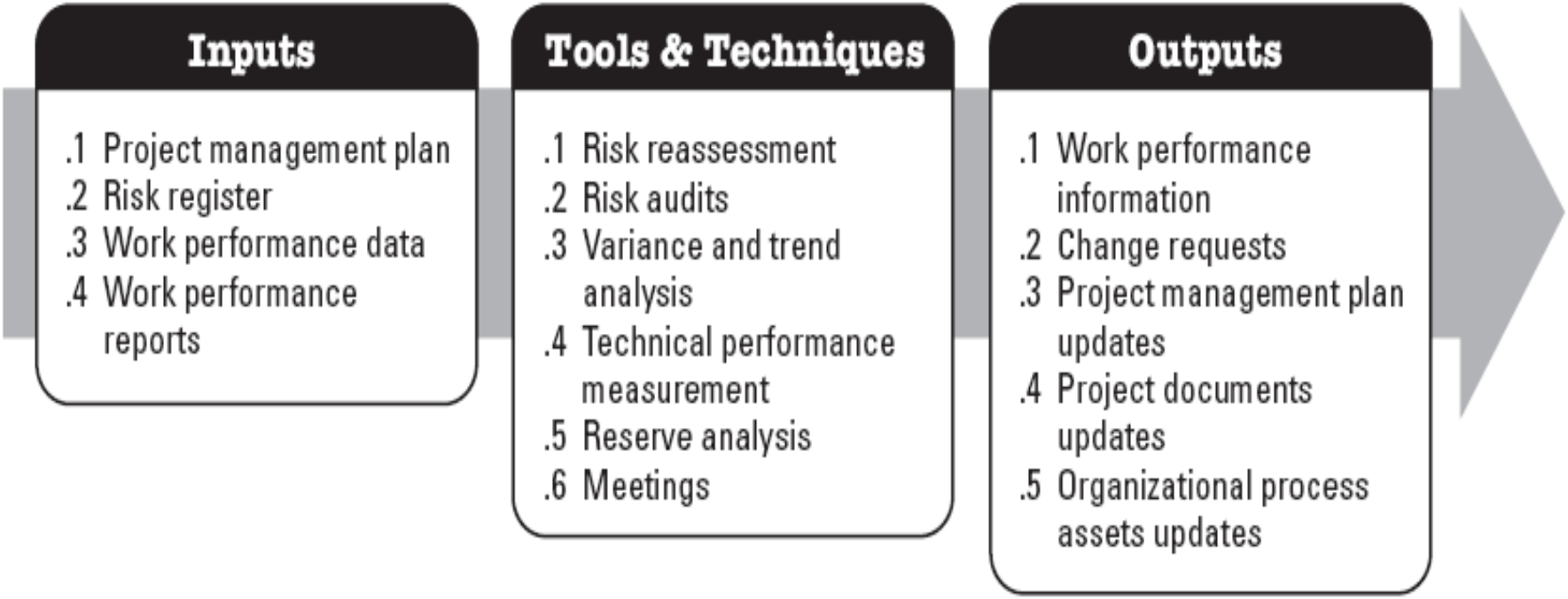
- Stakeholders' perception of the effectiveness of risk management is conditioned in part by:
  - The way in which risks are handled as they occur.
  - The number or characteristics of such events.

- It is important if risk occur, the information about the risk progress and effectiveness of the responses should be communicated at:
  - Regular intervals and in an honest manner adapted to the needs of each stakeholder.

This should be supported by a well-executed communications plan.

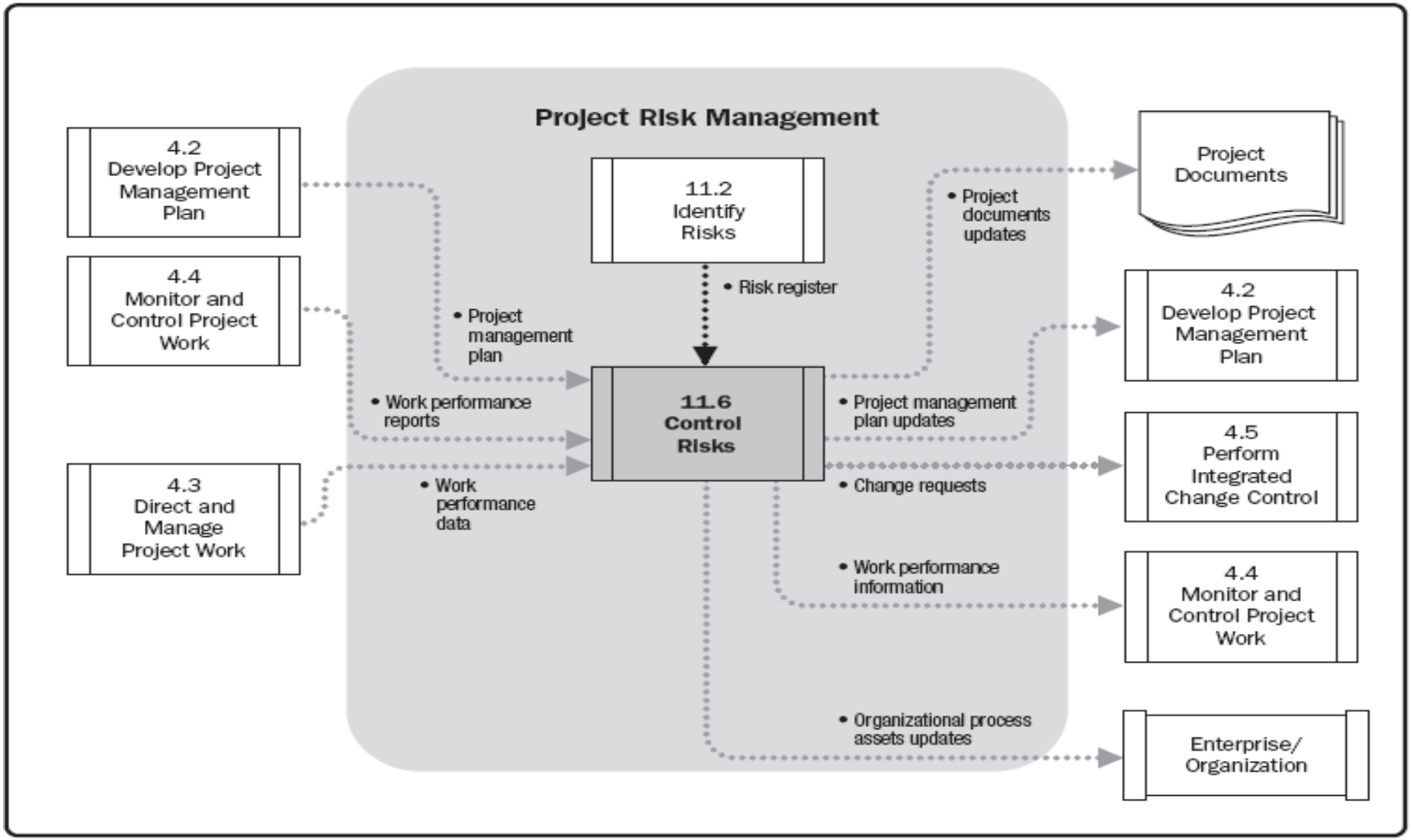
LESSON 9 Control Risks

9.4 Inputs, Tools & Techniques, and Outputs



LESSON 9 Control Risks
9.4 Inputs, Tools & Techniques, and Outputs

Control Risks Data Flow Diagram


Project Risk Management
4.2 Develop Project Management Plan
4.4 Monitor and Control Project Work
4.3 Direct and Manage Project Work
11.2 Identify Risks
11.6 Control Risks
• Risk register
• Project management plan
• Work performance reports
• Work performance data
• Project documents updates
• Project management plan updates
• Change requests
• Work performance information
• Organizational process assets updates
Project Documents
4.2 Develop Project Management Plan
4.5 Perform Integrated Change Control
4.4 Monitor and Control Project Work
Enterprise/ Organization

LESSON 9 Control Risks

9.4.1 Inputs

1- Project Management Plan

The project management plan, which includes the risk management plan, provides guidance for risk monitoring and controlling.

2- Risk Register

RISK REGISTER

Risk Identification						Qulitative process									Quantitative Process					Plan Risk Responses									
Risk description	Causes	Effects	ROOT Cause	Potential Risk Response	Nominated Risk Owner	Probability	Impact	Ranking or scores	urgency	Category	Risk in watch list	Trend in qualitative risk results	Need further analysis	Need Response	Probabilistic analysis	Probability of completion date	Probability of total cost	Prioritized list of quantified risks	Trends in quantitative	Risk owners and responsibilities	Agreed-upon response strategies	Risk Action owners and responsibi	Actions of Response stratigy	Trigger conditions&symptoms	Budget and schedule activities	Contingency plans and triggers	Fallback plans	Residual risks	Secondary risks	Contingency reserves

LESSON 9 Control Risks

9.4.1 Inputs

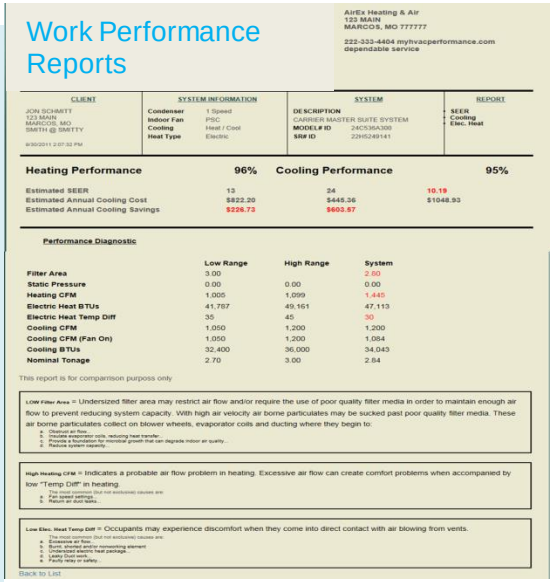
3- Work Performance Data **are the raw observations** and **measurements** identified during **direct and manage project work process.**

- Data are often viewed as the **lowest level of detail** from **which information is derived by other processes.**
- Data is gathered through work execution and passed to the **controlling processes of each process area for further analysis.**
- Work performance data related to various performance results possibly impacted by risks includes, but is not limited to:
  - **Deliverable status.**
  - **Schedule progress, start and finish dates of schedule activities.**
  - **Actual Costs.**
  - **Work completed.**
  - **Key performance indicators.**
  - **Technical performance measures.**
  - **Number of change requests.**
  - **Number of defects.**
  - **Actual durations.**

LESSON 9 Control Risks
9.4.1 Inputs

4- Work Performance Reports

- Output from Monitor and Control Project Work.
- Work performance reports are the physical or electronic representation of work performance information
- Work performance reports take information from performance measurements and analyze it to provide project work performance information including:
  - variance analysis.
  - earned value data.
  - forecasting data.
- These data points could be impactful in controlling risks performance.
- Examples:-
  status reports, memos, justifications, information notes, recommendations, and updates.



Question

You and your team are tracking the identified risks, you compiling several sources of information to assist you. Which one of the following would NOT provide assistance?

A. Work Performance information
B. The risk management plan
C. Work Performance Date
D. Risk register

Correct answer is: A
Now you are in the Control Risks process. All are inputs to that process except A is an output.

LESSON 9 Control Risks
9.4.2 Tools and Techniques

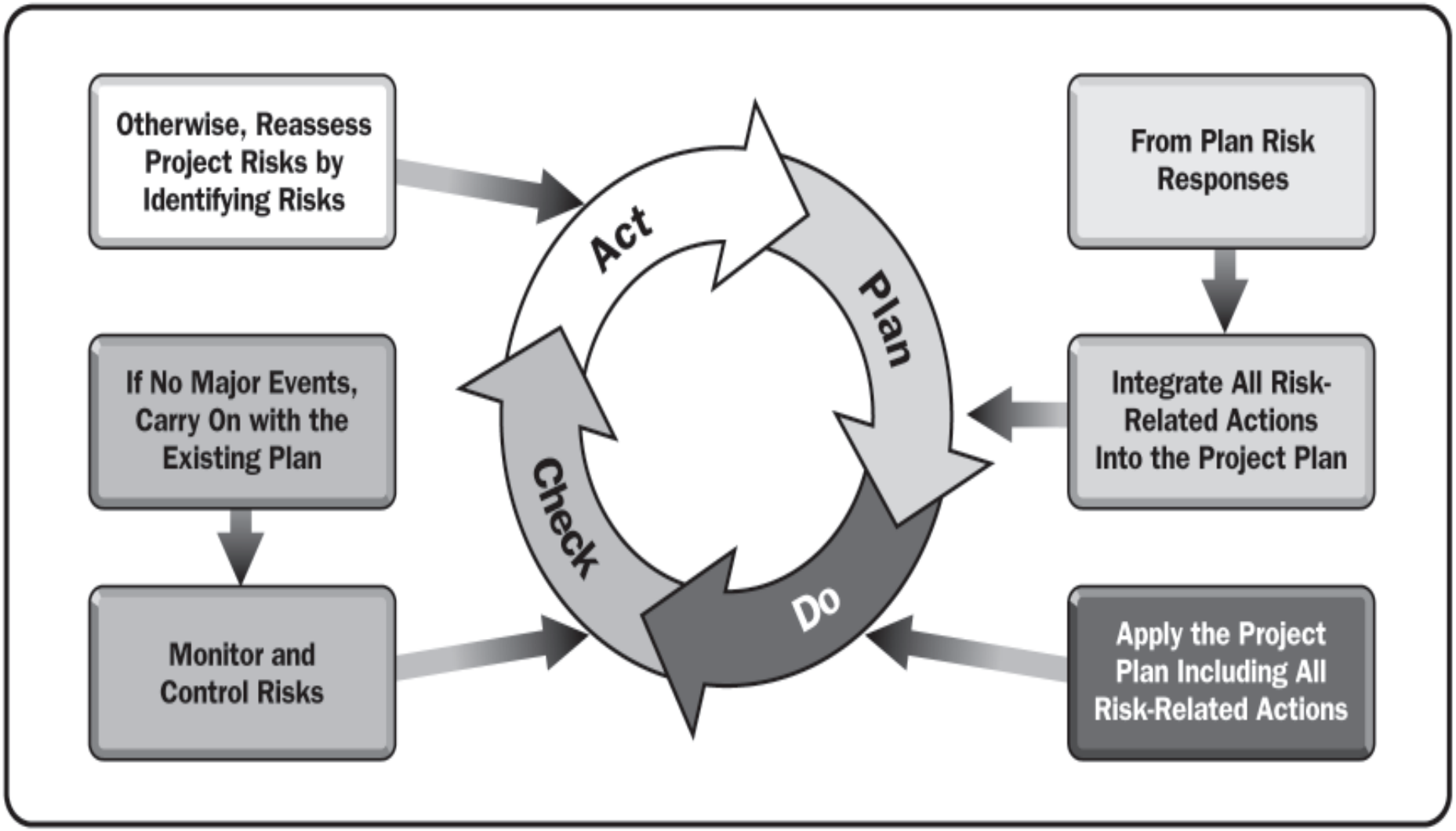
1- Risk Reassessment

- Control Risks often results in:
  - Identification of new risks.
  - Reassessment of current risks.
  - Closing of risks that are outdated.
- Project risk reassessments should be regularly scheduled. The amount and detail of repetition that are appropriate depends on how the project progresses relative to its objectives.
- The objective of risk reassessment is to ensure that the full risk management cycle is repeated as required to ensure effective control

Technique	Strengths	Weaknesses	CSFs
Risk Reassessment	• Forces a review of the project risks when it becomes necessary so that the risk register remains up-to-date	• Takes time and effort	• Well-maintained project and risk documentation scheme

LESSON 9 Control Risks
9.4.2 Tools and Techniques

1- Risk Reassessment Process


Otherwise, Reassess Project Risks by Identifying Risks
From Plan Risk Responses
Act
Plan
Check
Do
If No Major Events, Carry On with the Existing Plan
Integrate All Risk-Related Actions Into the Project Plan
Monitor and Control Risks
Apply the Project Plan Including All Risk-Related Actions

LESSON 9 Control Risks
9.4.2 Tools and Techniques

2- Risk Audits

- Risk audits examine and document the effectiveness of risk responses in dealing with identified risks and their root causes.
- Effectiveness of the risk management process.
- The project manager is responsible for ensuring that risk audits are performed at an appropriate frequency, as defined in the project's risk management plan.
- Risk audits may be included during routine project review meetings, or the team may choose to hold separate risk audit meetings.
- The format for the audit and its objectives should be clearly defined before the audit is conducted.

LESSON 9 Control Risks
9.4.2 Tools and Techniques

2- Risk Audits

- Risk audits are carried out in order to evaluate:
  - Are the risk management rules being carried out as specified ?
  - Are the risk management rules adequate for controlling the project?

Technique	Strengths	Weaknesses	CSFs
Risk Audits	• Provide a formal assessment of the compliance with the approach specified in the risk management plan	• Can be disruptive to the project and taken as too judgemental to the project team	• Well-specified risk management plan • Sensitivity to the burden it places on the project team

LESSON 9 Control Risks
9.4.2 Tools and Techniques

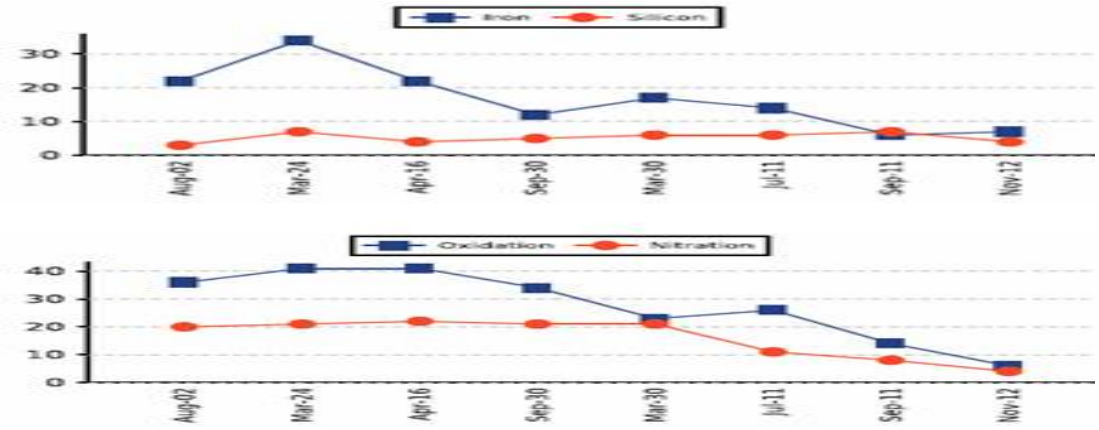
3- Trend Analysis

The **evolution of the variance values over time** should be analyzed in order to evaluate how the risk profile is changing:

- Whether previous actions are having the expected effect .
- Whether additional actions are required.

To complete performance index can be used to assess changes with respect to time and cost. TCPI = (BAC – EV)/(BAC – AC) Or TCPI= (BAC – EV)/(EAC – AC).

For the purposes of controlling risks, trends in the project's execution should be reviewed using performance information



LESSON 9 Control Risks
9.4.2 Tools and Techniques

3- Trend Analysis (Contd)

Technique	Strengths	Weaknesses	CSFs
Trend Analysis	• Provides an indication of the effectiveness of earlier responses • Can provide trigger conditions for responses	• Requires understanding of significant vs. non-significant variation	• Regular reporting and analysis of the critical values

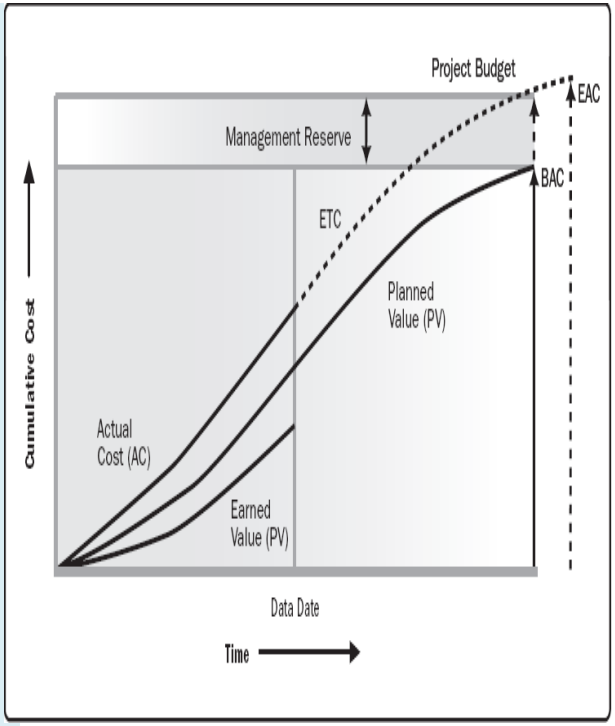
LESSON 9 Control Risks
9.4.2 Tools and Techniques

3- Variance analysis

1. Earned Value Analysis (CV, SV, CPI, SPI) can be used
   - Set thresholds for action.
   - Indicate when the risk process may be ineffective.
   - Variance from plan as the basis of forecasts
   - Forecast the cost at completion.

- ❑ Projections made using EVMS have been shown by experience to be reliable early in the project.

- ❑ Earned value analysis and other methods of project variance and trend analysis may be used for
   - monitoring overall project performance.



LESSON 9 Control Risks
9.4.2 Tools and Techniques

3- Variance analysis (Contd.)

- Outcomes from variance and trend analysis may forecast potential deviation of the project at completion from cost and schedule targets.
- Deviation from the baseline plan may indicate the potential impact of threats or opportunities.

Technique	Strengths	Weaknesses	CSFs
Variance Analysis	• Allows comparison between forecast and actual risk impacts • Can provide trigger conditions for responses • Provides data for Earned Value Analysis which can be compared to quantitative risk analysis results	• Does not show relationship with earlier data • The values can be taken out of context	• Realistic prior definitions of thresholds for "significant variance"

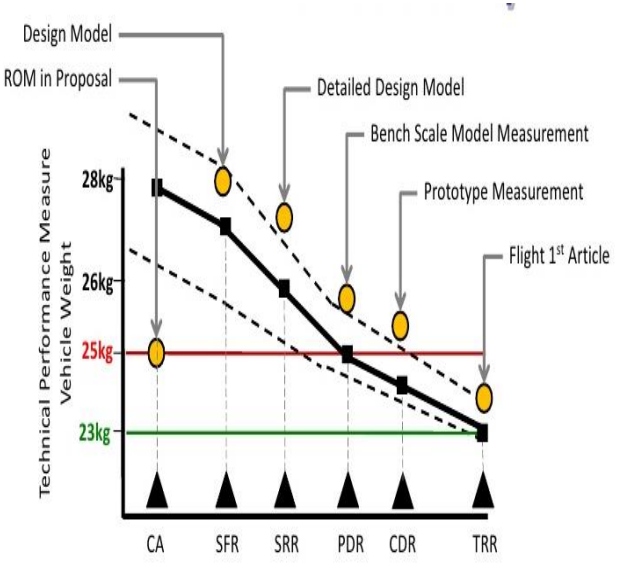
4- Technical Performance Measurement

- **Compares technical accomplishments during project execution to the schedule of technical achievement.**

- Requires :
  - Definition of objective.
  - Quantifiable measures of technical performance, to compare actual results against targets.

- Such technical performance measures:
  - Weight.
  - Transaction times.
  - Number of delivered defects.
  - Storage capacity.

- **Deviation**, such as more or less functionality than planned at a milestone, can help to forecast the degree of success in achieving the project's scope.

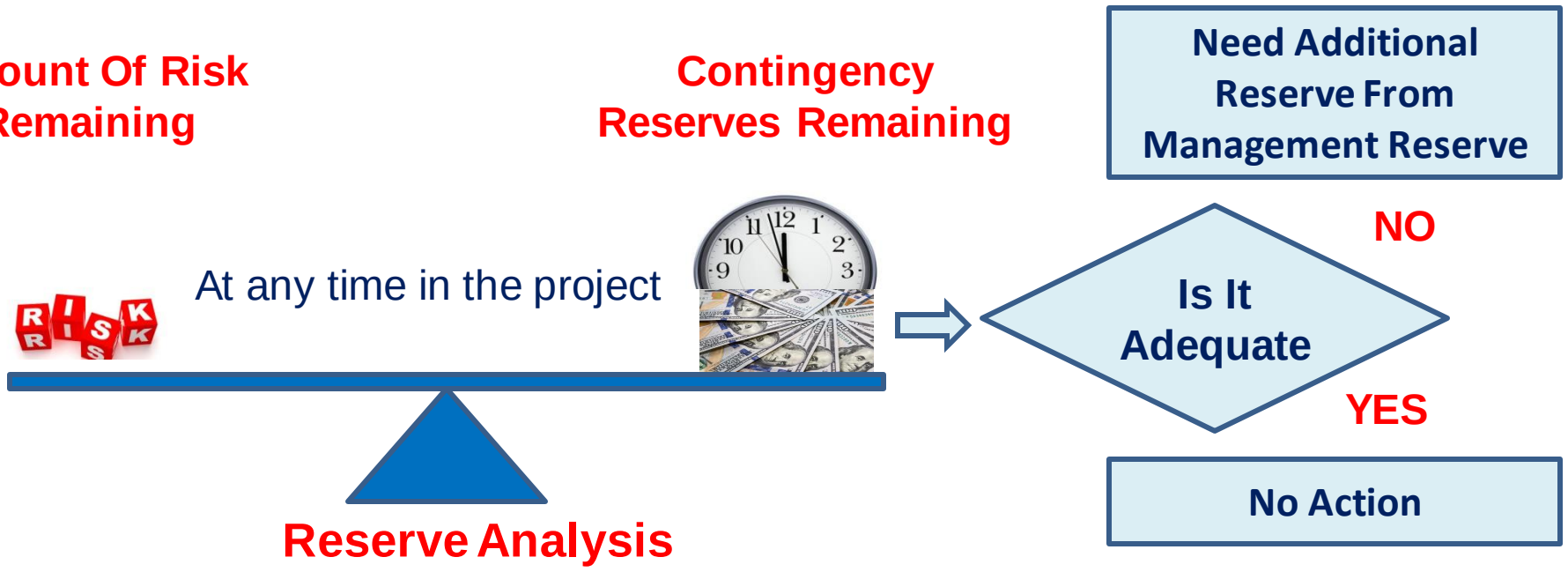


LESSON 9 Control Risks
9.4.2 Tools and Techniques

5- Reserve Analysis

- **Throughout execution** of the project, some risks cease or risks may occur with positive or negative impacts on budget or schedule contingency reserves.

Reserve analysis compares the amount of the contingency reserves remaining to the amount of risk remaining at any time in the project to determine if the remaining reserve is adequate or still provides the agreed level of confidence.



LESSON 9 Control Risks
9.4.2 Tools and Techniques

5- Reserve Analysis

- Tracking the state of the reserve through project execution will provide summary of the evolution of the status of the risks.
- This information can be useful when reporting up the organization to those responsible for several projects

Technique	Strengths	Weaknesses	CSFs
Reserve Analysis	• Provides a means of tracking spend and releasing contingency amounts as risks expire; can be applied to schedule reserves in the same way • Gives early warning of need to communicate with sponsor	• Could lead to unwarranted focus on cost dimension • Attention to overall measure of reserve depletion may hide detailed risks	• Prior detailed reserve planning • Accurate sizing of the contingency reserve of time or cost relative to the risk to overall project completion date and budget

6- Status Meetings

- Project risk management should be an agenda item at periodic status meetings.
- Risks can and should be on the agenda at all project reviews.
- The amount of time required for that item will vary, depending upon the:
  - Risks that have been identified.
  - Their priority.
  - Difficulty of response.
- The more often risk management is practiced, the easier it becomes.
- Frequent discussions about risk make it more likely that people will identify risks and opportunities.

6- Status Meetings (Contd)

Agenda items should cover the following:

- Top priority risks at present.
  - Are there any changes?
- Risks or trigger conditions that have occurred .
  - What is the status of the actions?
- Risks responded to in the last period.
  - Effectiveness of actions taken.
  - Are there any additional actions required?
- Risks closed in the last period.
  - Impact on the plans.
- Lessons to be added to the Organizational Process Assets .

6- Status Meetings (Contd)

Technique	Strengths	Weaknesses	CSFs
Status Meetings	• Provide a means of verifying information about the status of risks (active, occurred, retired) and maintaining team understanding	• Can seem unnecessary to some participants	• Good meeting preparation and discipline

7- Critical Chain Project Management (CCPM)

Technique	Strengths	Weaknesses	CSFs
Critical Chain Project Management (CCPM) → *see Chapter 8*	• Use of buffer penetration to trigger actions such as adjusting the relative priority of tasks		

Question

You are the project manager, During the Control risk process you start evolution of the variance values over time to evaluate how the risk profile is changing. What is the useful technique to do the above evaluation?

A. Variance analysis.
B. FMEA.
C. Reserve analysis.
D. Trend analysis.

Correct answer is D.
Trend analysis is the evolution of the variance values over time which should be analyzed in order to evaluate how the risk profile is changing, whether previous actions are having the expected effect and whether additional actions are required Practice Standard page #105.

LESSON5. IDENTIFY RISKS PROCESS

Question

Question

Tom is a project manager of his project XB for his organization TOT. He completed identify risk process, Qualitative risk analysis, Quantitative risk analysis, and Plan risk response. Now in Control risks process to implement the risks responses and reassessment. Which one of the following allows comparison between forecast and actual risk impacts, provides data for Earned Value Analysis which can be compared to quantitative risk analysis results and the values can be taken out of context?

A. System Dynamics.
B. Force Field Analysis.
C. Variance Analysis.
D. Trend Analysis.

Correct answer is C.

"Allows comparison between forecast and actual risk impacts and provides data for Earned Value Analysis which can be compared to quantitative risk analysis results" are strengths of Variance analysis. "The values can be taken out of context" is a weakness of Variance analysis. Practice Standard page 103.

LESSON5. IDENTIFY RISKS PROCESS

Question

Question

Roberto is a project manager of a Telecom project for his organization ATT. He completed identify risk process, Qualitative risk analysis, Quantitative risk analysis, and Plan risk response. Now in Control risks process. Which one of the following verifies the status of risks (active, occurred, retired) and maintaining team understanding?

A- System Dynamics.
B- Planning Meeting.
C- Variance Analysis.
D- Status Meeting.

Correct answer is D.
"Verifies the status of risks (active, occurred, retired) and maintaining team understanding" is strength of the Status Meeting. Practice Standard page #102.

Question

You are a project manager of new road project for your organization NAS. You and your team in the status meeting discussing the agenda meeting items. Which one of the following is an agenda meeting item?

A- Top priority risks at present and number of defects.

B- Risks closed in the last period and Risks responded to in the last period.

C- Number of defects and number of critical paths.

D- Top priority risks at present and Risks or Effective project team.

Correct answer is B.

Agenda items of the status meeting. Risk practice standard page #104-105.

LESSON 9 Control Risks
9.4.2 Tools and Techniques

1- Managing Contingency Reserves

- Reserves may have been allocated separately to cover time-related and cost-related risks.
- Techniques are required that allow the project manager to assess at any point in the project whether these provide the required level of confidence in the success of the project.
- Tools for managing time buffers should be closely integrated into the project's scheduling techniques.
- Tools for managing cost should be compatible with the financial practices.
- Tools are required to identify trends and forecast future outcomes to determine whether the reserves will remain sufficient.
- Tools are also required for tracking progress and spending in a consolidated manner.

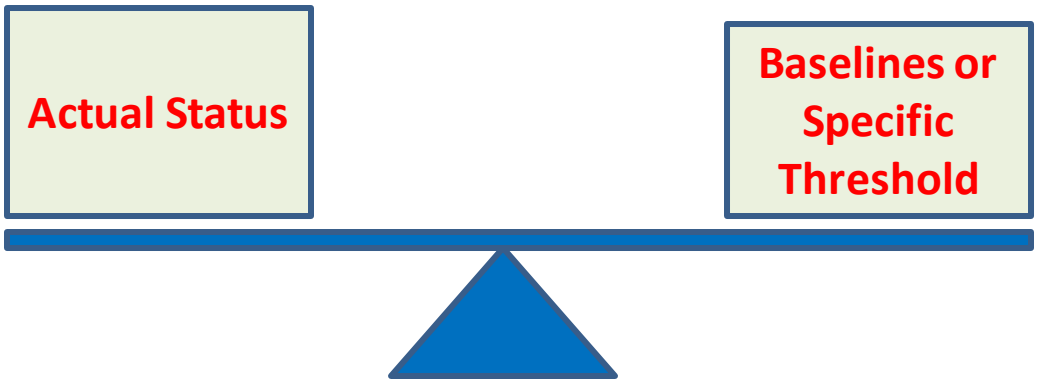
2- Tracking Trigger Conditions

- **Trigger conditions** and the **corresponding metrics** defined in Plan Risk Responses.
- Tools to Evaluate and track **conditions** against the **project baseline** or **specified thresholds**, based on actual status.
- Tools to **provide information** on risks related to the deliverables, such as performance, time and cost.

Trigger Conditions

Their Metrics

Plan Risk Responses



Evaluate And Track Conditions

3- Tracking Overall Risk

Tools are required in order to determine, as the project progresses, whether the responses are having the expected effect on the project's overall level of risk.

4-Tracking Compliance

- To monitor the quality of the execution of the responses and processes, a set of **quality metrics** such as **degree of variation from the baseline**, should **be tracked and recorded.**

- These metrics will normally have been defined in the risk management plan.

LESSON 9 Control Risks
9.4.3 Output

1- Work Performance Information

Work performance information, as a Control Risks output, provides a mechanism to communicate and support project decision making.

2- Change Requests

- Implementing contingency plans or workarounds sometimes **results in a change request.**
- **Change requests** are prepared and **submitted to the Perform Integrated Change Control process .**
- Change requests can include recommended corrective and preventive actions as well.

2- Change Requests

Recommended corrective actions.

- These are activities that **realign the performance** of the project work **with** the project management **plan.**
- They include contingency plans and workarounds.
- The workarounds for risks that were not initially planned, dealing with:
  - Emerging risks that were **previously unidentified if occur.**
  - **Accepted passively if occurs.**

Recommended preventive actions.

These are activities that **ensure that future performance** of the project work is **aligned with** the project management **plan.**

LESSON 9 Control Risks

9.4.3 Output

3- Project Management Plan Updates

- If the approved change requests affect the **risk management processes**, the corresponding component documents of the **project management plan** are revised and reissued to reflect the approved changes.

- The elements of the **project management plan** that may be updated are the same as those in **the Plan Risk Responses process.**

LESSON 9 Control Risks
9.4.3 Output

4 - Project Documents Updates

Risk register updates may include:

1- Outcomes of risk reassessments, risk audits, and periodic risk reviews.

These outcomes may include:

- Identification of new risks.
- Updates to probability, impact, priority, response plans and ownership.
- Update other elements of the risk register.
- Outcomes includes closing risks that are no longer applicable and releasing their associated reserves.

2- Actual outcomes of the project's risks and of the risk responses.

This information can help project managers to plan for risk throughout their organizations, as well as on future projects.

LESSON 9 Control Risks
9.4.3 Output

4 - Project Documents Updates

Risk register updates

RISK REGISTER

Risk Identification						Qulitative process									Quantitative Process					Plan Risk Responses									Control Risk Process	
Risk describtion	Causes	Effects	ROOT Cause	Potential Risk Response	Nominated Risk Owner	Probability	Impact	Ranking or scores	urgency	Category	Risk in watch list	Trend in qualitative risk results	Need further analysis	Need Response	Probabilistic analysis	Probability of completion date	Probability of total cost	Prioritized list of quantified risks	Trends in quantitative	Risk owners and responsibilities	Agreed-upon response strategies	Risk Action owners and responsibil	Actions of Response stratigy	Trigger conditions&symptoms	Budget and schedule activities	Contingency plans and triggers	Fallback plans	Residual risks	Secondary risks	Contingency reserves	Outcomes of risk reassessments, risk audits, and periodic risk reviews:- - Identification of new risks. - Updates to probability, impact, priority, response plans and ownership. - Update other elements of the risk register. - Outcomes includes closing risks that are no longer applicable and releasing their associated reserves.	Actual outcomes of the project's risks and of the risk responses. This information can help project managers to plan for risk throughout their organizations, as well as on future projects.

LESSON 9 Control Risks
9.4.3 Output

5 - Organizational Process Assets Updates

- The risk management processes produce information that may be used for future projects, and should be captured in the organizational process assets.

- **The organizational process assets that may be updated include:**
  - Templates for the risk management plan, including the probability and impact matrix and risk register.
  - Risk breakdown structure.
  - Lessons learned from the project risk management activities.

- **These documents should be updated:**
  - As needed
  - At project closure.

- Final versions of the risk register and the risk management plan templates, checklists, and risk breakdown structure are included.

LESSON 9 Control Risks
9.5 Documenting the Results

Documenting the Results of the Monitor and Control Risks Process

- The final control action of risk monitoring and controlling is to record actual data of risk management from start to finish of the project for future use .

- The definition of The following specified in the risk management plan.
  - what this information must include.
  - Storage mechanism.

- **The goal** of **record actual data** is to **ensure** that the significant risk management information is recorded to **provide concrete** data to the lessons learned process for **inclusion** in:
  - Lessons learned document.
  - Report.
  - Other communication vehicle.

LESSON 9 Control Risks

9.5 Documenting the Results

Typical information includes the following:

- For each identified risk or type of risk, whether it occurred, and, if so:
  - When and how often.
  - Impact.
  - Effectiveness of detection and of response.
  - Any unplanned, additional actions that were carried out.
- Effectiveness of avoidance or exploitation actions.
- Effectiveness of transfer and sharing actions.
- Unexpected or undocumented risks which occurred and data about them.
- Effectiveness of risk mitigation and enhancement actions.
- Occurrence of accepted threats or opportunities.

Typical information includes the following:

- The Information should provide the level of effort expended.
- **Costs and benefits** to the project of risk management activities should be provided.
- This information will need to be **archived and indexed** in a manner that will facilitate retrieval for easy review:
  - During the project.
  - At closure.
  - For future projects.
  - When the need arises.

Question

You are a project manager of your project Sigma. You completed identify risk process, Qualitative risk analysis, Quantitative risk analysis, Plan risk response and control risk process .What is the next step?

A. Implementation of risk response.
B. Risk reassessment.
C. Update lessons learned.
D. Inform sponsor.

Correct answer is C.
Organizational process assets updates is an output of control risk process. The organizational process assets that may be updated include, but are not limited to: Templates for the risk management plan, including the probability and impact matrix and risk register, Risk breakdown structure, and Lessons learned from the project risk management activities. PMBOK page #324.

Question

During the Status meeting in the project you asked the team about the meeting Agenda. Which of the following is an item of the meeting agenda?

A. Quantifying Risk tolerance.
B. Develop Risks responses plans.
C. Risks or trigger conditions that have occurred.
D. Prioritize Risks.

Correct answer is C.

Agenda items should cover the following:

Top priority risks at present (Are there any changes?).

Risks or trigger conditions that have occurred (What is the status of the actions?). Risks responded to in the last period (Effectiveness of actions taken, Are there any additional actions required?).

Risks closed in the last period (Impact on the plans).

Lessons to be added to the Organizational Process Assets.

The reference is risk practice standard Page #104&105

LESSON5. IDENTIFY RISKS PROCESS

Question

Question

The last action of monitoring and controlling Risk is recording the risk information to provide concrete data to the lessons learned process which of the following are the required information to be collected.

A. Effectiveness of avoidance or exploitation actions, Effectiveness of transfer and sharing actions, quality metrics.
B. Effectiveness of avoidance or exploitation actions, Effectiveness of transfer and sharing actions and Unexpected or undocumented risks which occurred and data about them.
C. Effectiveness of risk mitigation and enhancement actions, Occurrence of accepted threats or opportunities and historical information.
D. Effectiveness of avoidance or exploitation actions, Effectiveness of transfer and sharing actions and risk database.

Correct answer is B.

Reference to risk standard ch9 clause 9.4 page 55 Documenting the Results of the Monitor and Control Risks Process .The goal is to ensure that the significant risk management information is recorded to provide concrete data to the lessons learned process for inclusion in a lessons learned document, report, or other communication Vehicle, The information includes the following:- • Effectiveness of avoidance or exploitation actions. • Effectiveness of transfer and sharing actions. • Unexpected or undocumented risks which occurred and data about them. • Effectiveness of risk mitigation and enhancement actions. • Occurrence of accepted threats or opportunities.

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PROJECT RISK MANAGEMENT Course

PMI-RMP

LESSON 10
Questions

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